Vol. 26. No. 12. pp. 603 - 658
Abstracts 3661 - 4010

December, 1956

THE VETERINARY BULLETIN

COMPILED FROM WORLD LITERATURE

Prepared by the
COMMONWEALTH BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Published by the
COMMONWEALTH AGRICULTURAL BUREAUX
FARNHAM ROYAL, ENGLAND

COMMONWEALTH MYCOLOGICAL
10 DEC 1956

Commonwealth Agricultural Bureaux

EXECUTIVE COUNCIL

Member	*Representing*
C. E. LAMBERT, C.M.G. *(Chairman)*	Colonial Territories.
Lt.-Col. V. A. NICHOLAS, M.B.E. *(Vice-Chairman)*	Ceylon.
W. C. TAME	United Kingdom.
J. G. MALLOCH, M.B.E., Ph.D.	Canada.
A. SHAVITSKY	Australia.
V. ARMSTRONG, Ph.D.	New Zealand.
E. D. ANDREWS	Union of South Africa.
T. SWAMINATHAN, I.C.S.	India.
(To be nominated)	Pakistan.
J. E. C. COVENTRY	Federation of Rhodesia and Nyasaland.

Sir HERBERT HOWARD *(Secretary)*

COMMONWEALTH BUREAU OF ANIMAL HEALTH, WEYBRIDGE

Director:
M. CRAWFORD, M.R.C.V.S.

Assistant Director:
R. MACK, M.R.C.V.S.

Scientific Assistants:
E. GLASNER
E. V. LORD
M. G. GOTTS, B.A.
T. E. GATT RUTTER, M.R.C.V.S., B.Sc.
F. EILEEN WILLIAMS, B.A.

Consultant Director:
A. W. STABLEFORTH, D.Sc.(London), M.R.C.V.S., D.V.S.M.
Director, Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge.

ABSTRACTORS CONTRIBUTING TO THIS ISSUE

UNITED KINGDOM

J. G. Brotherston, M.R.C.V.S.
E. Cotchin, M.R.C.V.S
E. G. C. Clarke, M.A., PH.D.
F. L. M. Dawson, B.SC., M.A., PH.D., M.R.C.VS.
T. E. Gibson, B.V.SC., M.R.C.V.S.
M. Gitter, M.R.C.V.S.
Isobel W. Jennings, M.R.C.V.S.
D. W. Jolly, M.R.C.V.S.
F. T. W. Jordan, B.SC., M.R.C.V.S.
Dr. F. K. Leeb.
W. Mansi, M.V.SC.(Cairo), DIP.BACT.(Man.).
L. M. Markson, M.R.C.V.S.
G. P. Marshall.
F. R. Paulsen, B.SC., PH.D., F.R.I.C.
D. S. Papworth, M.SC., A.R.I.C.
A. E. Pierce, M.SC., PH.D., F.R.C.V.S., D.V.S.M.
W. E. Parish, B.V.SC., M.R.C.V.S.
D. S. Rabagliati, B.SC., F.R.C.V.S., D.V.S.M.
A. Seaman, B.SC., PH.D.
E. J. L. Soulsby, M.A., PH.D., M.R.C.V.S., D.V.S.M.

AUSTRALIA

I. G. Pearson, B.V.SC.

COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 26] December, 1956 [No. 12

DISEASES CAUSED BY BACTERIA AND FUNGI

HAMMER, D. (1956). Mikrokokkenmastitis der Ziege als Ursache einer Gruppenerkrankung beim Menschen. **[Staphylococcal mastitis in a goat as the cause of an epidemic illness in human beings.]**—*Arch. Lebensmittelhyg.* **7,** 152-155. **3661**

Gastro-enteritis developed in 5 people who drank milk from a goat with acute mastitis. *Staphylococcus aureus* was isolated from the goat's udder. I/p injection of its toxin produced diarrhoea and shivering in kittens.

—M.G.G.

WORSECK, M. (1956). Staphylokokken als Ursache von Lebensmittelvergiftungen und eigene Untersuchungen über die Toxidität von Mastitis-Staphylokokken. **[Staphylococci as a cause of food poisoning. Toxicity of mastitis staphylococci.]**—*Arch. Lebensmittelhyg.* **7,** 145-148. **3662**

After discussing methods of demonstrating pathogenic staphylococci, W. described tests with 45 strains of mastitis staphylococci. At room temp. in broth 15 strains were producing toxin within 2 days. Some strains were very resistant to heat, 6 continuing to produce toxin after 20 min. at 100°C. On oral administration 16 strains produced diarrhoea in kittens.

—M.G.G.

OVEJERO, S., DIEZ, M. & PASCUAL, R. (1955). Contribución al estudio de los caracteres biológicos y sensibilidad a los antibióticos del *Micrococcus mastitidis gangrenosae ovis* (Nocard, 1887). **[Biological characters and sensitivity to antibiotics of *Micrococcus mastitidis gangrenosae ovis* (*Staphylococcus aureus*).]**—*An. Fac. Vet. Leon.* 1955. 53-60. **3663**

An account of a study of 12 strains of *Staph. aureus*, isolated from cases of ovine gangrenous mastitis. There was a marked sensitivity *in vitro* to terramycin, chlortetracycline and chloramphenicol.—E.G.

GARROD, L. P. & WATERWORTH, P. M. (1956). **Behaviour *in vitro* of some new antistaphylococcal antibiotics.**—*Brit. med. J.* July 14th. 61-65. [Authors' summary modified.] **3664**

The following antibiotics were examined for antistaphylococcal activity by *in vitro* methods, a few tests being also done with other organisms: (1) erythromycin, (2) spiramycin, (3) antibiotic E129 and Factor B derived from it, (4) cephalosporin P_1, (5) micrococcin P, (6) albomycin, (7) novobiocin, (8) vancomycin. Their approx. order of merit for anti-staphylococcal activity was: bacteriostatic action—5, 1, 7, 3, 4, 8, 2, 6; bactericidal action—8, 3, 1, 7, 2, (4, 5, 6, not bactericidal under conditions of test); degree of bacterial resistance developed—8, 3, 2, 7, 1, (4, 5, 6 limits not reached). Cross-resistance studies revealed a relationship between erythromycin, spiramycin, and E129; there was no relationship between any of these 8 antibiotics and penicillin, streptomycin, chloramphenicol or tetracycline.

I. POUNDEN, W. D., FRANK, N. A. & KRAUSS, W. C. (1956). **The resistance of milk samples to the activity of *Streptococcus agalactiae* as affected by pasture.**—*Amer. J. vet. Res.* **17,** 227-230. **3665**

II. POUNDEN, W. D., FRANK, N. A., BROWN, R. W. & SCHERER, R. K. (1956). **The resistance of milk samples to the activity of *Streptococcus agalactiae* as affected by feeding silage.**—*Ibid.* 231-234. **3666**

I & II. Milk samples vary in their capacity to inhibit the formation of acid by *Str. agalactiae* [see *V.B.* **23,** 1790-91]. This inhibitory property decreased for some weeks in the milk of cows after they were turned out to pasture in spring, or after maize silage was added to a ration of hay and grain; it did not decrease when the ration was changed from pasture, hay and grain to forage-crop silage, hay and grain. It was suggested that the resistance of cows to *Str.*

agalactiae mastitis was directly related to the capacity of their milk to inhibit acid formation by this organism.—R.M.

WARTENBERG, L. (1956). Badania nad amylazą mleka krów dotkniętych ostrym ichronicznym zapaleniem wymienia. **[Amylase content of milk in cows with acute or chronic mastitis.]** —*Méd. vét., Varsovie.* **12,** 422-427. [In Polish. English and Russian summaries.] **3667**

W. examined 128 samples of milk from healthy cows and 44 samples from cows with mastitis, and found that the amylolytic power of milk depended on the physiological state of the udder. It increased considerably with the chloride content of milk in acute mastitis and decreased when the chloride content fell.

—M. GITTER.

RODMAN, M. (1956). Leczenie zapaleń wymion polokaina. **[Treatment of mastitis with procaine.]**—*Méd. vét., Varsovie.* **12,** 427-428. [In Polish. English and Russian summaries.] **3668**

R. treated successfully 18 cases of bovine mastitis by anaesthetizing the nerves of the udder with 20–30 ml. of 2% procaine solution injected with a 10 cm. long needle between the 4th and 5th transverse processes of the lumbar vertebrae, using the method described by Bashkirov [*V.B.* **26,** 1782].—M. GITTER.

ROSENDAL, K. (1956). **Grouping of hemolytic streptococci belonging to groups A, C and G. A comparison between the results obtained by precipitation and by slide-agglutination.** —*Acta. path. microbiol. scand.* **39,** 127-136. [In English. Abst. from author's summary.] **3669**

The results of both methods agreed. A trypsin-labile substance, probably the M antigen, has an inhibiting influence on group-agglutination. Group-agglutination may be used as a routine method.

WOOD, W. B., JR. & SMITH, M. R. (1956). **An experimental analysis of the curative action of penicillin in acute bacterial infections. I. The relationship of bacterial growth rates to the antimicrobial effect of penicillin.**—*J. exp. Med.* **103,** 487-498. **3670**

SMITH, M. R. & WOOD, W. B., JR. (1956). **An experimental analysis of the curative action of penicillin in acute bacterial infections. II. The role of phagocytic cells in the process of recovery. III. The effect of suppuration upon the antibacterial action of the drug.**—*Ibid.* **103,** 499-508 & 509-522. **3671**

I. Types I and II pneumococci were killed by penicillin when at the log-phase of growth in infusion broth or a serous exudate. When in purulent exudate from subcutaneous abscesses they did not grow rapidly and the penicillin had only a slow effect. These *in vitro* results were correlated with histological observations on lung tissues from rats with pneumonia caused by the same pneumococcal strains. The areas of consolidation showed pneumococci being phagocytosed at a time when, in the outer zone of oedema, the cellular exudate had been cleared of organisms by the antibiotic.

II. Intramuscular infections by the same strains were induced in normal and irradiated mice. The resultant bacterial population was a thousand times greater in the leucopenic mice. Penicillin treatment was effective in both groups if given 9 hours after infection, when the organisms were multiplying, but less effective in irradiated mice if given 24 hours after infection.

III. The course of a self-limiting, experimentally-induced subcutaneous abscess, infected with Type III pneumococci, was studied in the rat. An initial serous exudate increased in volume and maintained a constant population of organisms (due to multiplication) which were phagocytosed by the leucocytes present. The exudate gradually thickened, the leucocytes degenerated, and the bacteria stopped multiplying and gradually decreased in numbers. As would be expected from the previous results penicillin therapy was effective only in the initial stages.—A. SEAMAN.

SMITH, R. T. & THOMAS, L. (1956). **The lethal effect of endotoxins on the chick embryo.**—*J. exp. Med.* **104,** 217-231. [Authors' summary modified.] **3672**

Inoculation of the chorioallantoic membrane of the 10-day-old chick embryos with endotoxin preparations derived from the meningococcus and other Gram-negative microorganisms caused multiple haemorrhages and death within a few hours. This lethal effect was specific for the general class of endotoxins derived from Gram-negative bacteria. Susceptibility to endotoxin was greatest in 10-day-old embryos. The optimal incubation temp. was 39·5°C.; at 28°C. embryos were completely protected. The lethal effect was prevented by small amounts of cortisone, hydrocortisone or 9-alpha fluorohydrocortisone, but not by cholesterol, desoxycorticosterone, and 1-dehydrocortisone.

GUIDA, V. O. (1955). Antagonismo "in vitro" de microorganismos saprófitas do sólo (bactérias, fungos e actinomicetos) sôbre o *B.*

anthracis. [**Antagonistic action of saprophytic micro-organisms from the soil on** *B. anthracis*.] — *Arch. Inst. biol.* (*Def. agric. anim.*), *S. Paulo*. **22,** 51-56. [English abst. modified.] **3673**

Certain strains of *B. cereus, B. subtilis, B. pumilus, B. brevis, B. megatherium, Penicillium notatum* and a *Streptomyces* species inhibited *B. anthracis in vitro*. Thus the survival of *B. anthracis* in the field may depend on the bacterial flora of the soil.

SMITH, H., TEMPEST, D. W., STANLEY, J. L., HARRIS-SMITH, P. W. & GALLOP, R. C. (1956). **The chemical basis of the virulence of** *Bacillus anthracis*. **VII. Two components of the anthrax toxin: their relationship to known immunising aggressins.**—*Brit. J. exp. Path.* **37,** 263-271. [Abst. from survey of paper (p. i).] **3674**

The authors claim that *B. anthracis* toxin found in the plasma of g. pigs dying of anthrax has at least two components. They failed to prepare anthrax toxin *in vitro* in conditions akin to those *in vivo*.

QUANDER, J. (1956). Über den Stand der Tilgung der Rindertuberkulose in Nordrhein-Westfalen. [**Present stage of the campaign for the eradication of bovine TB. in North Rhine-Westphalia.**] — *Rindertuberkulose*. **5,** 137-144. **3675**

During the first 6 years of TB.-eradication in North Rhine-Westphalia 108,003 herds of cattle (58·8%) were cleared of TB. and in some districts the disease was eradicated. If eradication progresses at the present rate of 13% *per annum*, total eradication of TB. in North Rhine Westphalia could be completed by 1958. Experience has shown that progress is slowed down in the final stages by re-infection due to the uncontrolled purchase of cattle, and efficient measures for the prevention of re-infection are therefore essential.—F. K. LEEB.

GAGGERMEIER, G. & GRAF, R. (1956). Ursachen der Reinfektionen in tuberkulosefreien Beständen. [**Causes of re-infection of TB.-free herds.**]—*Tierärztl. Umsch.* **11,** 241-243. **3676**

A statistical survey of 8,675 attested herds in Bavaria revealed that 2,226 tuberculin reactors were responsible for the re-infection of 840 herds. Purchase of animals from infected farms (47·8%) and tuberculin-anergic animals (40·8%) were the two main sources of re-infection; others included the hire of working animals (1·3%), pasture infection (3·5%), change of ownership of farms with introduction of infected stock (0·2%). 7·4% of the re-infections were due to the fact that attested herds were situated near infected farms; stricter measures are therefore required to prevent re-infection on common pastures and at service.—F. K. LEEB.

SCHELLNER, H. (1956). Untersuchungen über die Gefährdung des Rindes auf Tuberkelbakterien-infizierten Weiden. [**Risk of infection in cattle grazing pastures contaminated with tubercle bacilli.**] — *Rindertuberkulose*. **5,** 179-188. **3677**

Pasture, which had been contaminated with tubercle bacilli by infected cattle or by spraying with filtrate of tuberculous bovine lung or udder tissue suspension diluted in water, was grazed after intervals of 24 hours and 14 days by 42 cattle negative to the tuberculin test. TB. was later demonstrated in 23 animals by the tuberculin test and in 21 by P.M. and bacteriological examination. The weather at the time was cool and wet.—M.G.G.

TRAUTWEIN, K. (1956). Die Stalldesinfektion im Rahmen der Tuberkulosetilgung. [**Byre disinfection in the control of TB.**] — *Rindertuberkulose*. **5,** 170-179. **3678**

T. listed a number of disinfectants which are equal in action to a 3% solution of formalin. "Sigambol A", 10%, a combination of glycols, used as a spray or aerosol, has been tested extensively and, for practical purposes, has been found to be superior to formalin.

—F. K. LEEB.

RITTER, H. W. (1956). **The germicidal effect of a quaternary ammonium compound (cetylpyridium chloride) on** *Mycobacterium tuberculosis*. — *Appl. Microbiol.* **4,** 114-116. **3679**

Cetylpyridium chloride, at conc. of 1:1000 in a 50% aqueous soln. of ethanol, sterilized after 10 min. glass rods contaminated with tubercle bacilli.—R.M.

DUBOS, R. J. (1956). **Chemoprophylaxis, immunity, and prevention in tuberculosis.**—*Amer. Rev. Tuberc.* **74,** 117-120. **3680**

D. strongly criticized two recently published papers:— Block & Segal (1955). *Amer Rev. Tuberc.* **71,** 228-248; and Ferebee & Palmer (1956). *Ibid* **73,** 1-18.

The first paper concluded that bacterial multiplication of B.C.G. vaccine was not essential for immunity since administration of isoniazid to mice up to challenge did not reduce the immunity. D. points out that the mice

received, i/p, a very large dose of vaccine (0·1 ml. of culture on different days), and it is most unlikely that multiplication was completely and immediately inhibited.

The second paper implied that the successful treatment of heavy TB. infection in g. pigs with isoniazid, with subsequent apparent immunity, could be applied to the prevention of TB. in man. D. contends that the air-borne infective dose in man is so small that an immune reaction would not be induced in a person receiving chemoprophylaxis. Furthermore, it is highly improbable that these g. pigs were cured of TB. by isoniazid. The disease was merely arrested.—M.G.G.

Ippen, R. (1956). Zur vergleichenden Pathologie der Langhans'schen Riesenzelle im tuberkulösen Granulationsgewebe. **[Comparative pathology of Langhans' giant cells in tuberculous granulation tissue.]**—*Mh. VetMed.* **11,** 217-224. **3681**

Tuberculous granulation tissue from 15 species of animals was examined for giant cells, and for possible morphological differences. Considerable variations occurred in the various species, the cells being found most frequently in horses, cattle, and in pigs infected with avian type TB.; they were less numerous in rabbits and g. pigs and were absent in canine and feline species. Form, shape and size of giant cells, and the structure of the nucleus and cell plasma are discussed.—F. K. Leeb.

Hubrig, T. & Ohder, H. (1956). Die Objektträgerkultur als diagnostisches Mittel zum Nachweis des *Mycobact. tuberculosis* var. *bovis*. **[Diagnosis of bovine-type tubercle bacilli by slide culture.]** — *Berl. Münch. tierärztl. Wschr.* **69,** 290-293. [English summary.] **3682**

In slide cultures there was no difference in growth and morphology between tubercle bacilli and non-pathogenic mycobacteria. The method is therefore not recommended for diagnosis. —M.G.G.

Boyden, S. V. & Andersen, M. E. (1956). **Diet and experimental tuberculosis in the guinea-pig. The importance of the source of ascorbic acid.**—*Acta. path. microbiol. scand.* **39,** 107-116. [In English. Authors' summary modified.] **3683**

Virulent tubercle bacilli were inoculated i/v into g. pigs fed different diets. Those receiving fodder beet died 2–5 weeks later. Neither the administration of vitamins A and D nor of water *ad libitum* changed this picture. But the administration of ascorbic acid prolonged the survival time. Substitution of the beet by cabbage or by ascorbic acid and water resulted in an even longer survival time, no animal dying before the 13th week of infection. Loss of weight one or two weeks after infection occurred, but in the longer surviving groups it was only transient, being followed by recovery to the previous level, before finally falling again before death.

May, K. J. & Weiser, R. S. (1956). **The tuberculin reaction. VI. Studies on the effect of tuberculin on tissue cultures of the corneas of tuberculin-sensitive guinea pigs.** — *J. Immunol.* **77,** 34-39. [Authors' summary copied *verbatim*.] **3684**

Observation on a large number of explants of corneal epithelium from tuberculin-sensitive guinea pigs grown in the presence of OT and PPD indicate that tuberculoprotein does not exert a cytotoxic action on such cells.

Baumann, R., Krenn, E. & Liebisch, H. (1956). Über die käsige Lymphknotenentzündung der Schweine. (V. Tierversuche mit Reinkulturen). **[Caseous lymphadenitis in pigs. V. Animal experiments with pure cultures of a mycobacterium.]**—*Wien. tierärztl. Mschr.* **43,** 341-345. [English, French and Italian summaries.] **3685**

Cultures of a mycobacterium isolated from pigs with caseous lymphadenitis [See *V.B.* **26,** 714] were injected i/v into fowls and rabbits, and s/c into g. pigs. The fowls and rabbits grew well and the organism could not be recovered from the organs of the fowls 3–4 months later, but it was isolated from numerous small foci in the liver of the rabbits. The g. pigs developed swelling of the lymph nodes at the point of injection from which acid-fast rods recovered. The name *Mycobacterium suis* is proposed for this new type.—M.G.G.

Schaaf, J., Beerwerth, W. & Grodde, S. (1956). Über die Paratuberkulose des Rindes, ihre Verbreitung, Diagnose und Bekämpfung. **[Incidence, diagnosis and control of Johne's disease in cattle.]**—*Rindertuberkulose.* **5,** 144-154. **3686**

With the progressive eradication of TB. in North Germany, increasing attention is being paid to Johne's disease. In some districts the incidence varies from 2–33% with a clear difference in the age incidence between cows (35·5%) and heifers (13·2%). The complement-fixation test appears to be the most reliable method of diagnosing clinical and subclinical infection. Early assessment of the degree of

infection of herds by this test and differential tuberculin testing by simultaneous use of bovine and avian types of tuberculin, and johnin, combined with the elimination of all positive reactors, slaughter of clinical cases and routine testing, every 8 weeks, are recommended for controlling the disease. The use of live vaccine, widely adopted in France is not recommended in Germany because of its interference with TB. eradication methods.

The two main sources of infection are believed to be introduction of new stock and use of common pastures.—F. K. Leeb.

Larsen, A. B., Merkal, R. S. & Vardaman, T. H. (1956). **Survival time of *Mycobacterium paratuberculosis*.**—*Amer. J. vet. Res.* **17,** 549-551. **3687**

Mycobact. johnei survived as follows:—less than 30 days in a mixture of cattle urine and faeces; up to 19 months in water, whether slightly acid or slightly alkaline, or in saline; 47 months in a desiccator; up to 100 hours on filter paper exposed to sunlight. It was concluded that the organism would survive longest under clumps of trees, sheltered from the sun, where cattle stand for long periods during warm weather. [See also *V.B.* **13,** 26; **15,** 2127.] —R.M.

Goret, P. & Joubert, L. (1955). Enzootie de pyobacillose chez la truie sous la forme d'une "maladie de l'élevage". **[An outbreak of *Corynebacterium pyogenes* infection in pigs.]** —*Bull. Soc. Sci. vét. Lyon.* **57,** 173-192. **3688**

This outbreak in a breeding unit was characterized by mastitis, suppurative metritis, and abortion in the sows, and acute enteritis and death from septicaemia in the piglets. By means of vaccine, penicillin therapy, surgical intervention where necessary, and hygienic measures, the disease was controlled and finally eradicated. During the outbreak there was no other intercurrent infection, such as swine fever or swine influenza, nor any infection of the cattle, horses, rabbits and fowls kept in the same locality.—I. W. Jennings.

Asplin, F. D. (1956). **Experiments on the transmission of a septicaemic disease of ducklings.**—*Vet. Rec.* **68,** 588-590. [Author's summary modified.] **3689**

The results of a series of experiments indicated that infection with *Pfeifferella anatipestifer* readily takes place through wounds, scratches, or punctures of the skin, particularly that of the feet. The bearing that these results might have on the control and possible seasonal incidence was discussed.

Fras, A. (1955). Titracija maleina pomoću hemaglutinacije. **[Evaluation of mallein by haemagglutination.]**—*Vet. Arhiv.* **25,** 195-205. [In Croat. English and German summaries.] **3690**

An account of evaluation of mallein samples either by establishing the highest dilution of specific hyperimmune serum capable of agglutinating r.b.c. sensitized with a fixed amount of mallein or by establishing the smallest amount of mallein, necessary to sensitize sheep corpuscles sufficiently to agglutinate, when fixed amounts of serum were added. Results were compared with those obtained with standard mallein.—E.G.

Wetmore, P. W. & Gochenour, W. S., Jr. (1956). **Comparative studies of the genus *Malleomyces* and selected *Pseudomonas* species. I. Morphological and cultural characteristics.**—*J. Bact.* **72,** 79-89. [Authors' summary modified.] **3691**

The morphological, cultural and biochemical activities of 3 strains of *Pfeifferella mallei,* 15 strains of *Pf. whitmori,* 20 strains of *Ps. pyocyanea* and 8 other *Pseudomonas* species were compared. Members of the genus *Pfeifferella* were readily distinguished from *Ps. pyocyanea* by their lack of growth on SS agar, desoxycholate agar, sodium azide agar, and cetyltrimethyl amonium bromide agar, and when incubated at 21°C.; oxidation of carbohydrates, proteolysis and nitrate reduction were of little value in the differentiation of *Pf. whitmori* from *Ps. pyocyanea;* in the genus *Pseudomonas,* speciation was possible by reactions on differential plating media, proteolysis, reduction of nitrate and growth at pH 5·6; it was not possible to induce phenazine pigment production in 18 strains of *Pfeifferella* by methods which enhanced fluorescein and pyocyanin production in 7 previously non-pigmented strains of pseudomonads; the cephalotrichous nature of *Pf. whitmori* as revealed by the electron microscope indicated that it could be included in the family Pseudomonadaceae.

Goldie, W. & Collins, D. H. (1956). **Erysipelothrix arthritis in rabbits: experimental induction and the response to cortisone.**—*J. Path. Bact.* **71,** 425-439. [Authors' summary modified.] **3692**

Erysipelothrix rhusiopathiae caused arthritis in 13 out of 14 rabbits when given i/v by repeated small injections, and in 6 out of 9 rabbits when given once. The total dose ranged from 7 to 28 million organisms and was too

small in most instances to produce other pathological effects. The arthritis was studied for up to 850 days after infection. Proliferation of granulation tissue and of synovial lining was accompanied by a mainly lymphocytic or plasma cell reaction, often focal or follicular. One rabbit which lived for 91 days after a single injection of 21,000 million *E. rhusiopathiae* developed a similar form of arthritis but with severe systemic effects. *E. monocytogenes*, although virulent, did not cause arthritis. Cortisone, when administered throughout infection tended to favour the induction of arthritis by repeated small doses of *E. rhusiopathiae*. The granulomatous reaction in the joints was, however, less marked, and lymphocyte and plasma cell infiltration was reduced. When given 6 weeks after infection, cortisone had no apparent effect.

VACCARO, A. (1956). La dihydrostreptomicina nel malrossino sperimentale dei piccione. **[Dihydrostreptomycin in the treatment of experimental *Erysipelothrix rhusiopathiae* infection in pigeons.]** — *Acta med. vet., Naples*. **11**, 237-250. [English, French and German summaries.] **3693**

The effective dose of dihydrostreptomycin against experimental swine erysipelas in pigeons was 4·16 mg. every 6 hours for 48 hours or 6·24 mg. every 6 hours for 36 hours.—T.E.G.R.

LINSERT, H. (1956). Beitrag zur serologischen Diagnose der Listeriose. **[Serological diagnosis of *Listeria* infection.]**—*Berl. Münch. tierärztl. Wschr.* **69**, 223-226. [English summary.] **3694**

Agglutination tests on sheep from infected, and from non-infected flocks gave positive titres in 5–8% and 3·7% respectively. Of healthy cattle tested only 1·7% were positive. Titres of 1:800 and over were regarded as positive, and those between 1:400 and 1:800 as suspect. The slow agglutination reaction may be of value for herd testing.—F. K. LEEB.

SCHULTE, F. & SCHOLZ, H. -D. (1956). Listerienmeningitis bei Schafen, hervorgerufen durch einen in Deutschland seltenen Listerientyp. **[Meningitis in sheep caused by a type of listeria uncommon in Germany.]** — *Dtsch. tierärztl. Wschr.* **63**, 257-260. **3695**

The authors reported an outbreak of listeriosis in a large flock of sheep and described serological and biochemical methods of identification. Infection was shown, by serological test, to be due to *Erysipelothrix* (*Listeria*) *monocytogenes*, of the subtype 4B, hitherto unknown in animals in Germany. Attention is drawn to the importance of typing of strains, in order to clarify epidemiological connexions between human and animal infections.—F. K. LEEB.

SANDBU, H. (1956). Listeria monocytogenes som abortårsak hos geit. **[*Listeria monocytogenes* as a cause of abortion in goats.]** — *Nord. VetMed.* **8**, 585-594. [In Norwegian. English and German summaries.] **3696**

In 3 herds of 91 goats *Erysipelothrix monocytogenes* infection caused abortion in 14 and encephalitis in 4 others. No symptoms were observed before abortion.—M.G.G.

MAYER, H. (1956). Listeriainfektionen bei Chinchilla. **[Listeria infection in chinchillas.]** —*Berl. Münch. tierärztl. Wschr.* **69**, 221-223. [English summary.] **3697**

Erysipelothrix (*Listeria*) *monocytogenes* infection was demonstrated in 15 out of 72 chinchillas which died on one farm within 4 months. The agents were of serotypes I and IVb, indicating two sources of infection. Daily administration of 10–12·5 mg. of aureomycin in the drinking water for 3 weeks prevented further deaths from the disease.—M.G.G.

FONTAINE, J. & MÉGRET, C. (1955). Observations de pasteurellose chronique du lapin. **[Chronic pasteurella infection in rabbits.]**—*Bull. Soc. Sci. vét. Lyon.* **57**, 167-172a. **3698**

The authors describe three cases of subcutaneous abscess formation in rabbits, from one of which a fully virulent strain of *Past. septica* was isolated. Sporadic mortality in the rabbitry indicated the likelihood that these animals were carriers, and the authors recommend that rabbits surviving an outbreak of pasteurellosis should be slaughtered, or that animals newly introduced into the rabbitry should be vaccinated.—I. W. JENNINGS.

NEUMANN, H. -J. & SEELIG, G. (1956). Bacterium pyocyaneum (Pseudomonas aeruginosa) als Mastitiserreger. **[*Pseudomonas pyocyanea* as the cause of bovine mastitis.]** —*Prakt. Tierarzt.* No. 9. 245-254. **3699**

Ps. pyocyanea was isolated from udder secretions and tissues of a case of acute mastitis of haemorrhagic character in a post-parturient cow, which had failed to respond to penicillin and aureomycin ointment. P.M. a large haematoma was present in the inflamed udder tissue. A ewe was unsuccessfully treated with penicillin, streptomycin and sulphonamide infusions, but responded to intramammary oxytetracycline suspension combined with polymyxin B sulphate and simultaneous intramuscular inj. of oxytetracycline. Details are given

of the clinical picture and treatment of several other cases of mastitis in cows, encountered during routine examinations, from which *Ps. pyocyanea* had been isolated either in pure culture or together with streptococci and staphylococci.—E.G.

MOSIER, J. E., TWIEHAUS, M. J. & COWAN, J. H. (1956). **Septicemia in puppies.** — *Vet. Ext. Quart. Univ. Pa.* No. 143. pp. 111-113. **3700**

Septicaemia in 5 litters of puppies was attributed to *Pseudomonas pyocyanea* and in 3 other litters to bacteria of the coli-aerogenes group. M. suggested that the mammary glands were the source of infection. Treatment of the bitch and puppies with polymyxin B or streptomycin was successful.—R.M.

KAUFFMANN, F. (1956). **A simplified biochemical table of Enterobacteriaceae.**—*Acta. path. microbiol. scand.* **39,** 103-106. [In English. Author's summary modified.] **3701**

A simplified biochemical table of Enterobacteriaceae is presented which gives the characteristic reactions of the groups.

EDWARDS, P. R., MCWHORTER, A. C. & FIFE, M. A. (1956). **The Arizona group of Enterobacteriaceae in animals and man. Occurrence and distribution.**—*Bull. World Hlth Org.* **14,** 511-528. [French summary.] **3702**

Among 1,300 cultures isolated, 96 serotypes have been found. The organisms have been identified in epidemic infections with high mortality, mainly in fowls where the infection has been shown to be transmitted through eggs. In man, the organisms have been recovered from cases of gastro-enteritis, bacteraemia, and localized infections (bone, brain and liver). The large number of strains derived from sick and healthy reptiles suggests that reptiles are the normal host. The clear identification of these organisms as causative agents of disease demolishes the concept that only non-lactose fermenters in the Enterobacteriaceae are pathogenic.—A. SEAMAN.

HOLZ, K. (1956). Über die Bedeutung der durch bakteriologische Fleischuntersuchungen ermittelten Salmonellen im Gebiet des Niederrheins. **[Significance of the salmonella species revealed by bacteriological meat inspection in the region of the Lower Rhine.]** —*Arch. Lebensmittelhyg.* **7,** 121-123. **3703**

Bacteriological meat inspection revealed a higher proportion of *Salmonella* infections in the region of the Lower Rhine than in other parts of Germany. From 1948 to 1955, out of 23,442 samples 689 (2·94%) were positive. Fourteen different types were found, the commonest being *S. dublin*. *S. bovis-morbificans* was isolated 9 times. Contamination of water-meadows by sewage appears to be the chief source of infection.—M.G.G.

DIAGELER, A. & KOTTER, L. (1956). Über das Vorkommen von Salmonellen in Bayern während der Jahre 1946 bis 1954. **[Occurrence of salmonella in Bavaria during 1946-54.]**—*Berl. Münch. tierärztl. Wschr.* **69,** 281-285. [English summary.] **3704**

In this period salmonella were demonstrated in 951 samples of meat and other food. Of the 14 types which occurred, *S. typhi-murium* was the most frequent, being found in 524 samples. —M.G.G.

BISCHOFF, J. (1956). Salmonella braenderup als Ursache einer Lebensmittelvergiftung. **[*Salmonella braenderup* in pork as cause of food poisoning in man.]** — *Berl. Münch. tierärztl. Wschr.* **69,** 293-294. [English summary.] **3705**

Diagnosis was established by bacteriological tests of the pork and by examination of the patient's faeces. Attention is drawn to a noticeable increase in the incidence of rare types of salmonella such as *S. chester, S. braenderup, S. montevideo, S. thompson,* and *S. aberdeen* in Germany. Imported fish meal may be a vehicle for salmonella organisms.—F. K. LEEB.

GELLERT, R. (1956). Salmonellosis Kunzendorf bei Läuferschweinen, behandelt mit Aureomycin-Supplement. **[*Salmonella cholerae-suis* infection in store pigs treated with aureomycin supplement.]**—*Tierärztl. Umsch.* **11,** 181-183. **3706**

Eleven store pigs about 10 weeks old and harbouring a chronic infection with *Salmonella cholerae-suis* were treated with an aureomycin supplement containing 4·4 g. of aureomycin per 100 g. This was given for 4 days, by stomach tube and in 250 ml. of fresh milk, in a daily dosage of 15 g. (corresponding to 33–82 mg. of aureomycin per kg. body weight). Three of the animals, apparently too seriously affected for successful treatment, died during the trial. The remaining 8 pigs showed marked clinical improvement. They were killed on the 5th day, and pathological and bacteriological examination of their organs led the authors to conclude that oral treatment with aureomycin supplement in the stated dosage successfully controlled *S. cholerae-suis* septicaemia.

—G. P. MARSHALL.

VINDEL CAURIN, J. A. (1956). Estudio bacteriológico y serológico sobre las salmonellas de origen porcino. **[Bacteriological and serological study of *Salmonella* species of porcine origin.]** — *Rev. Patronato Biol. anim., Madrid.* **2,** 53-61. **3707**

Of 32 strains isolated in Spain from cases of pure salmonellosis, and as complicating factors in cases of swine fever, 20 were *S. choleraesuis,* 7 *S. cholerae-suis* var. *kunzendorf,* 3 *S. typhi-suis,* one *S. typhi-murium* and one *S. montevideo.*—I. W. JENNINGS.

SCHNEIDER, P. A. (1956). A propos d'une recrudescence des salmonelloses animales. Salmonellose chez un lièvre et chez une buse. **[An increase in salmonella infection of animals. Infection in a hare and a buzzard.]** — *Schweiz. Arch. Tierheilk.* **98,** 351-357. [In French. English, German and Italian summaries.] **3708**

S. reported an increase in salmonella infection in wild and domesticated animals in Switzerland during 1954–56. *S. typhi-murium* was isolated from a hare and a buzzard.—R.M.

GAUGUSCH, Z. & KAFEL, S. (1956). Próby ustalenia czasokresu nosicielstwa pałeczki *Salmonella typhimurium* w stadach kaczek stanowiących materiał rzeżny. **[Duration of the *Salmonella typhi-murium* carrier stage in live and slaughtered ducks.]**—*Méd. vét., Varsovie.* **12,** 409-413. [In Polish. English and Russian summaries.] **3709**

The authors consider that frequent bacteriological examination of droppings is a more reliable method than serological examination for the detection of *S. typhi-murium* carriers in ducks because agglutinins appear very irregularly in the blood of infected birds. In experimentally infected ducks the organism appeared in the droppings 3 hours after infection and the carrier stage continued for 14 days. In a field outbreak of *S. typhi-murium* infection the carrier stage did not exceed 53 days from the time the birds were moved to clean premises. —M. GITTER.

SCHOOP, G. & ZETTL, K. (1956). Zur Frage der Behandlung der chronischen Salmonellainfektion der Tauben. **[Treatment of chronic *Salmonella* infection in pigeons.]**—*Tierärztl. Umsch.* **11,** 256-257. **3710**

Intramuscular injections of 50 mg. streptomycin daily, on 3 successive days, is a satisfactory treatment for chronic salmonella infection of pigeons. An alternative method is oral administration of dihydrostreptomycin sulphate, 160 mg. on the first day, followed by 85 mg. daily on the 2nd and 3rd days. Repetition of treatment 8 weeks later had no untoward effects.—F. K. LEEB.

THOMSEN, A. (1956). De resultaten der bestrijding van het besmettelijk verwerpen bij runderen in Denemarken. **[Results of the control of bovine brucellosis in Denmark.]**—*Vlaam. diergeneesk. Tijdschr.* **25,** 1-16. [In Flemish. English, French and German summaries.] **3711**

T. described the organization of control measures, by means of which a large part of Denmark has been freed from bovine brucellosis. The use of vaccine against this disease has almost ceased. During the past ten years the number of human being with brucellosis has substantially declined.—R.M.

YUSKOVETS, M. K. (1956). Eradication de la brucellose en U.R.S.S. **[Eradication of brucellosis in the U.S.S.R.]**—*Bull. Off. int. Epiz.* **46,** May. pp. 366-374. [English summary.] **3712**

Control measures enforced by the state are based on the segregation of infected animals, sanitation and quarantine of infected herds. Infected herds are subjected to monthly tests and are only declared clean after two successive negative results and freedom from brucella abortion for a period of 6 months. Calves born to cows from infected herds are separated from those born to non-infected cows and are kept on their dam's milk for the first fortnight and on pasteurized milk thereafter. Vaccination with an attenuated strain such as Strain 19 is practised where complete segregation is not possible and where the incidence is high. In sheep and goats reactors and aborting females are slaughtered. Vaccination is resorted to on heavily infected farms. The diagnostic tests applied are the tube agglutination and the c.f. tests for cattle and the "brucellergin" and the c.f. tests for sheep and goats. Serological reactions following vaccination are discussed. —T.E.G.R.

FEJA, E. (1956). Vergleichende blut- und milchserologische Untersuchungen bei Kühen brucelloseverdächtiger Bestände. **[Comparison of the blood test and the milk test for the diagnosis of brucellosis in cattle.]**—*Berl. Münch. tierärztl. Wschr.* **69,** 250-252. [English summary.] **3713**

Of 2,000 cows tested for brucellosis 419 were positive and 1,368 negative to both tests; 119 were positive and 41 doubtful only to the

blood test and 53 were positive only to the milk test. It is recommended that both tests be used for diagnosis.—M.G.G.

SEELEMANN, M. (1956). Mehr Klarheit und Einheitlichkeit bei der Brucellose-Schutzimpfung. **[Standardization of immunization against brucellosis.]**—*Tierärztl. Umsch.* **11,** 284-287. **3714**

S. emphasized the need for standardization of brucella vaccines in Germany. His long experience had shown that injection of 5 ml. of *Br. abortus* Strain 19, containing 2^9–3^9 organisms per ml. repeated after an interval of 4 weeks, is a sound method of vaccination. The best age for vaccination is 6–12 months, but where early service is practised 5–8 months is a satisfactory age.—F. K. LEEB.

VAN DER SCHEER, A. F. (1956). **Observations on the lyophilization of *Brucella abortus*, Strain 19. I. Improvement of the survival rate.**—*Leeuwenhoek ned. Tijdschr.* **22,** 193-204. [Author's summary modified.] **3715**

A suspending medium containing 2% tryptose, 0·5% neutralized ascorbic acid and 0·75% thiourea was used. In 100 separate batches of vaccine dried in this medium, the average survival rate after primary drying was 88%; in the finished sealed glass ampoules it was 82%. These results were obtained only when a freshly prepared concentrated soln. of the reducing substances was added shortly before freezing of the Strain 19 suspension.

VERGE, J., PARAF, A. & COMYN, M. (1956). La brucellose du porc. Son identification en France. **[Identification of brucellosis in pigs in France.]** — *Rec. Méd. vét.* **132,** 433-442. **3716**

The authors report for the first time *Br. suis* infection in pigs in France. Since 1946, hares have been imported into France from Hungary, Czechoslovakia and Yugoslavia and in 1951 and 1952 *Br. suis* was found in these animals. It is assumed that the domestic pigs have become infected from this source.

—I. W. JENNINGS.

KARMANN, P. & SCHOLZ, H. -D. (1956). Beitrag zur Bekämpfung des Maltafiebers der Schafe im Lande Nordrhein-Westfalen. **[Control of brucellosis in sheep in North Rhine-Westphalia.]**—*Mh. Tierheilk.* **8,** 127-134. **3717**

Following the discovery in 1954 of *Br. melitensis* infection in sheep in North Rhine Westphalia, the agglutination and the brucellin tests were carried out in 80 flocks; some were tested up to 8 times. The agglutination test was more suitable for diagnosis during the first few weeks of infection, although good results were obtained even after months. A 5% saline soln. proved superior to normal saline. The brucellin test gave good results only after several months, and, by itself, is not considered to be sufficiently reliable. Agglutination and brucellin tests are complementary but cannot replace each other.—F. K. LEEB.

QUANDER, J. (1956). Die Bekämpfung der Brucellose der Schafe und Ziegen in Nordrhein-Westfalen. **[Control of brucellosis in sheep and goats in North Rhine-Westphalia.]** —*Dtsch. tierärztl. Wschr.* **63,** 252-257. **3718**

Tests on 98,769 sheep in North Rhine Westphalia yielded serological or allergic reactions to *Br. melitensis* in 16·1%; 7,481 animals were ordered to be destroyed. In North Rhine an incidence of up to 100% was observed in some flocks, while in Westphalia-Lippe it never exceeded 3%. In view of the risk of human infection, complete eradication of heavily infected flocks and elimination and destruction of all reactors from flocks with a low incidence are strongly advocated. Legislation restricting the introduction of new stock should remain in force until the disease has completely disappeared from Germany.—F. K. LEEB.

I. PARNAS, J. & CHODKOWSKI, A. (1956). Recherches sur la brucellose comme anthropozoonose en Pologne. (Microbiologie. Diagnostic. Epidémiologie. Prophylaxie.) **[Brucellosis in man and animals in Poland.]** — *Bull. Off. int. Epiz.* **45,** 329-363. **3719**

II. PARNAS, J., CHODKOWSKI, A., LAZUGA, K. & MIERZSEJEWSKI, T. (1956). Recherches concernant la brucellose en Pologne. **[Brucellosis in Poland.** — *Arch. Inst. Pasteur Tunis.* **33,** 249-295. **3720**

I. & II. In a survey of human and animal brucellosis carried out by the Medical Institute of Industrial and Rural Hygiene, 160 strains of *Brucella* were isolated. From a study of these, and the literature on the subject, the authors proposed an entirely new classification of the genus.

A study of the epidemiology in man revealed 14% reactors among 3,000 rural workers. Of the clinically active cases, most were of the chronic type. Parallel studies in man and animals confirmed the direct connexion between the level of infection in animals and the incidence of brucellosis in the attendants and their families.—I. W. JENNINGS.

FERGUSON, L. C. & POWERS, T. E. (1956). **Experimental leptospirosis in pregnant swine.** —*Amer. J. vet. Res.* **17**, 471-477. **3721**

Cultures of *Leptospira pomona* were instilled into the vagina of 6 gilts within 24 hours after service. Antibodies to *L. pomona* appeared in the blood of all 7–9 days after infection, but only 2 had a febrile reaction. None had a reproductive disturbance which could be attributed to infection: 5 farrowed normally (2 of them only after a second service) and the 6th gilt had dystocia. Nine other gilts were infected by instillation of cultures on to the nasal and conjunctival mucous membranes, 1–3 months after service: 5 farrowed normally, one aborted and the others failed to conceive; they all had febrile reactions and developed antibodies. Abortions occurring in field outbreaks [see *V.B.* **24**, 354 & 3447] may have been due to infection at a late stage of pregnancy or to a more virulent strain of *L. pomona*. —R.M.

ZAHARIJA, I. (1955). Reakcija odraslih kokoši na inokulaciju leptospira. **[Response of adult fowls to experimental *Leptospira* infection.]**—*Vet. Arhiv.* **25**, 313-318. [In Croat. English and French summaries.] **3722**

Z. infected 9 adult fowls i/v with 2 ml. of live *Leptospira canicola* and *L. pomona* culture. Although clinical symptoms were absent, titres of up to 1:128,000 were obtained and high titres persisted for several months. Live cultures given i/m did not produce titres. Of three fowls given six 2 ml. doses of formol-killed *L. pomona* culture i/m, one yielded a titre of 1:2,000. Z. discussed the value of fowls for the production of hyperimmune serum and for identification of strains.—E.G.

MOSKOWITZ, M., DEVERELL, M. W. & MCKINNEY, R. (1956). **Protection against *Clostridium perfringens* Type A toxin by a metal-chelating compound.**—*Science.* **123**, 1077-1078. **3723**

Ethylenediamine tetraacetic acid (EDTA) protected 10 mice when injected i/d as a mixture with 2 m.l.d. of α toxin of *Cl. welchii* Type A. Saturation of the chelating power of the compound by calcium did not effect its protective power, but this was completely lost if the EDTA was saturated with zinc, cobalt or manganese. When EDTA and the toxin were injected separately, only half of the mice survived. The calcium salt of EDTA is relatively non-toxic and its use in gas gangrene treatment is suggested.—A. SEAMAN.

DUMITH ARTEAGA, G. (1955). La hemoglobinuria ictero-hemorragica (hemoglobinuria bacilar, enfermedad de las aguas rojas) en Venezuela. **[Ictero-haemorrhagic haemoglobinuria (*Clostridium haemolyticum* infection) in Venezuela.]** — *Bol. Inst. Invest. vet. Caracas.* **7**, No. 23. 3-13. [English summary.] **3724**

An acute septicaemic disease causing 95–100% mortality has been reported for the first time in adult cattle in Venezuela; it is characterised by haemoglobinuria and dysentery, and occasionally nervous complications. Cultural, biological and serological tests indicate that *Cl. haemolyticum* is the organism responsible. In practically all cases, the animals are found to be carrying a heavy burden of *Fasciola hepatica*. Complete control can be obtained with formolized vaccines.

—I. W. JENNINGS.

SURJÁN, M. (1956). **The large scale production of tetanus toxin. I. Toxin production in media prepared with peptic-tryptic-ereptic digested meat or casein.** — *Schweiz. Z. allg. Path.* **19**, 311-317. [In English. French and German summaries.] **3725**

Culture medium for the production of tetanus toxin was prepared by digesting meat or casein first by pepsin and then by a trypsin-erepsin suspension. Better results were obtained with meat than with casein. 12,000 litres of medium were prepared. The yield of toxin was $0{\cdot}8–15 \times 10^6$ m.l.d. per ml.—R.M.

GUIDA, V. O. (1955). Antagonismo "in vitro" de microorganismos do solo (bactérias, fungos e actinomicetos) sôbre *Clostridia*. **[Antagonistic action of saprophytic micro-organisms from the soil on clostridium.]** — *Arch. Inst. biol. (Def. agric. anim.), S. Paulo.* **22**, 57-66. [English abst. modified.] **3726**

The antagonistic action of aerobic sporulated bacteria (*Bacillus*), fungi and actinomycetes on clostridium was studied. Many species of *Bacillus* inhibited their growth *in vitro*. All these micro-organisms live in the soil and an interaction among them is possible. The occurrence of *Cl. tetani, Cl. botulinum, Cl. septicum, Cl. welchii* and other species in the soil is probably related to an equilibrium between them and the saprophytic microbial flora.

PLASTRIDGE, W. N. (1956). **Vibrio fetus infection in cattle.**—*Vet. Sci. News, Univ. Wis.* **10**, No. 1. pp. 3-6. **3727**

A brief account of the characteristics of the organism, and the transmission, diagnosis and treatment of the infection.—A. SEAMAN.

MITSCHERLICH, E. & FORSCHNER, E. (1956). Untersuchungen über die Vibrio-fetus-Infektion des Rindes. [*Vibrio fetus* **infection of cattle.**]—*Mh. Tierheilk.* **8,** 135-147. **3728**

Comparative cultural, serological and biological tests were carried out on 9 strains of vibrios from aborted foetuses, 24 strains from the genital organs of cows, and 18 strains from bull semen and preputial washings. Strains of *V. fetus* always produced catalase, some also produced hydrogen sulphide. Non-pathogenic strains of vibrio produce few, if any, traces of catalase, but regularly produce hydrogen sulphide. *V. fetus* is not sufficiently pathogenic for hamsters and g. pigs to make these animals suitable for diagnostic tests.—F. K. LEEB.

JACOTOT, H. & VALLÉE, A. (1956). Nouvelles données sur l'infection du bétail français par "Vibrio foetus". [**Further information on** *V. fetus* **infection of cattle and sheep in France.**]—*Bull. Acad. vét. Fr.* **29,** 121-126. Discussion: pp. 126-128. **3729**

As a result of testing almost 1,000 serum samples from cattle and sheep, the authors consider that *V. fetus* infection is present in at least 18 Departments. Bacteriological examination revealed the infection in 11 specimens from cattle and in one sheep foetus.—M.G.G.

CHEVÉ, J. & GAUTHIER, J. (1956). Étude biochimique de souches de "V. foetus" d'origine bovine. [**Biochemical study of** *V. fetus* **strains of bovine origin.**]—*Bull. Acad. vét. Fr.* **29,** 115-119. **3730**

The authors studied the biochemical and growth characteristics of 51 strains of *V. fetus* of bovine and human origin, and 7 strains of *V. bubulus*. Both species, except two *V. fetus* strains, reduced nitrates to nitrites; neither species produced indole; all of the *V. bubulus* and 8 of the *V. fetus* strains produced hydrogen sulphide; only *V. bubulus* grew in deep culture; all except one of the *V. fetus* and none of the *V. bubulus* strains were catalase-positive.

—M.G.G.

BIBERSTEIN, E. L. (1956). **Growth phase and bacterial morphology as related to antigen sensitivity of** *Vibrio fetus* **cultures.**—*Cornell Vet.* **46,** 171-177. **3731**

Five different strains of *V. fetus* were grown on Bacto thiol agar under 10% CO_2. The cultures were harvested at different periods between 3 and 20 days for the preparation of the antigen suspension. The most agglutinable antigens were those prepared from cultures incubated for the shortest possible time. At this period 90 to 100% of the organisms were in the spirillar form. As the cultures aged the organisms became increasingly pleomorphic.

—A. E. PIERCE.

SHERIFF, R. B. (1956). **A note on bovine diphtheroid stomatitis in the Nakuru District of Kenya and its successful treatment with chloramphenicol.** — *Vet. Rec.* **68,** 497-498. **3732**

This disease, caused by *Fusiformis necrophorus,* occurs enzootically on dairy farms and affects both young and adult stock; the picture may resemble that of rinderpest. Clinical manifestations are severe and develop quickly, being first noticed on the tongue and less frequently on the cheeks and fauces; secondary pulmonary and intestinal symptoms appear almost immediately and in untreated cases death ensues in 36 to 48 hours.

Treatment was with chloramphenicol, i/m, 2 mg. per lb. body wt. once daily; the mouth lesions were curetted, and dressed daily with chloromycetin 10% tincture. Cure was usually achieved in 2 to 3 days.—E.V.L.

ANDERSON, G. W. & LAMASTER, J. P. (1956). **The control of chronic calf pneumonia.**—*J. Amer. vet. med. Ass.* **129,** 57-58. **3733**

Viruses or fungi have not been isolated from lungs of diseased calves in S. Carolina. Killed vaccines prepared from *Micrococcus aureus, Corynebacterium pyogenes* and *C. pseudodiphtheriticum* protected calves vaccinated s/c with 2·5 ml. at birth, 2·5 ml. when one week old, 5·0 ml. when one month old and 5·0 ml. when 3 months old. Antibiotics were only partially effective.—E.V.L.

PARNAS, J. (1956). Utilisation du microscope électronique pour les investigations microbiologiques concernant les bactéries pathogènes. [**Use of the electron microscope in study of pathogenic bacteria.**] — *Bull. Off. int. Epiz.* **45,** 364-383. **3734**

The article consists of 19 electron micrographs [some of indifferent quality] of: swine influenza virus; the bacteriophages of *Escherchia coli* and of *Corynebacterium equi; C. pyogenes* from pigs and from horses, *C. pseudotuberculosis, Pasteurella septica, Past. pseudotuberculosis rodentium, Brucella tularensis,* tularine M., *Brucella,* and brucellin PD. These are accompanied by a few notes.—A. SEAMAN.

REITMAN, M. & WEDUM, A. G. (1956). **Microbiological safety.**—*Publ. Hlth. Rep., Wash.* **71,** 659-665. **3735**

The authors determined the aerosol con-

tamination in a laboratory after various procedures and accidents in bacteriological technique. *Chromobacterium indicum* was the chief organism used and the air was sampled by the sieve type apparatus described by Anderson *et al.* [*V.B* **24,** 1443]. Grinding tissue with mortar and pestle, decanting the supernatant after centrifugation, resuspending packed cells, inserting a hot loop in a culture, withdrawing a culture sample from a vaccine bottle, opening a freeze-dried tube, spreading an inoculum on a rough agar surface, and shaking and blending cultures in high-speed mixers appeared to be potentially dangerous procedures. Safety equipment was described, with illustrations. [See also *V.B.* **24,** 1322].
—M.G.G.

AINSWORTH, G. C. & AUSTWICK, P. K. C. (1955). **A survey of animal mycoses in Britain; mycological aspects.** — *Trans. Brit. mycol. Soc.* **38,** 369-386. **3736**

This paper includes an annotated list of 28 pathogenic fungi isolated from farm animals in Great Britain. [See also *V.B.* **25,** 1616.]
—R.M.

CARNAGHAN, R. B. A., GITTER, M. & BLAXLAND, J. D. (1956). **Favus in poultry: an outbreak of *Trichophyton gallinae* infection.**—*Vet. Rec.* **68,** 600-601. [Abst. from authors' summary.] **3737**

An account of an outbreak in a flock of fowls. The condition was transmissible to cockerels but not to g. pigs and rabbits.

HERRELL, W. E., BALOWS, A. & DAILEY, J. S. (1955). **Erythromycin in the treatment of actinomycosis.** — *Antibiotic Med.* **1,** 507-512. **3738**

Oral administration of 300 mg. erythomycin daily for 3–7 weeks cured *Actinomyces israeli* infection in 4 human beings.—R.M.

FLETCHER, R. B., LINTON, A. H. & OSBORNE, A. D. (1956). **Actinobacillosis of the tongue of a dog.**—*Vet. Rec.* **68,** 645-646. [Authors' summary modified.[**3739**

An account of infection of the tongue of a dog with an organism of the *Actinobacillus* group and its successful treatment with penicillin.

TURNER, A. W. (1956). Les méthodes de prophylaxie contre la péripneumonie contagieuse des bovidés en Australie. **[Control of bovine contagious pleuro-pneumonia in Australia.]** — *Bull. Off. int. Epiz.* **46,** May. pp. 382-403. [English summary.] **3740**

An account is given of the disease in Australia from its first appearance in 1858 to date. The infection has been stamped out from the Southern regions and is now virtually confined to the Northern region where control is difficult owing to climatic, geographical and economic conditions. The methods of control adopted to date are based on compulsory vaccination, long periods of quarantine, restriction of movement and destruction of clinical cases. Serological diagnosis is discussed. The c.f. test is considered fully reliable while the whole blood slide agglutination test is simple and rapid and merits further investigation. T. discussed the various methods of immunization, including the culture vaccine which is at present in use.—T.E.G.R.

MARTINS-MENDÈS, A. (1956). Prévention de la péripneumonie contagieuse des bovidés en Angola. **[Prevention of bovine contagious pleuropneumonia in Angola.]**—*Bull. Off. int. Epiz.* **46,** May. pp. 420-426. [English summary.] **3741**

A culture vaccine was used. Severe reactions occurred in 200 of 18,000 healthy animals inoculated, for the first time, and in 310 of 50,000 healthy cattle after re-inoculation with a culture vaccine. There were 23 deaths attributable to vaccination. The vaccine was also used on 4,000 cattle in infected herds and although the development of the disease in infected animals was accelerated, the spread of the infection was checked and mortality dropped from 30% to 9%; there was no mortality from vaccination. Stored at 4° to 10°C. the vaccine keeps for months and immunity is established 3 weeks after vaccination. An adsorbed formol vaccine was also prepared. The immunity conferred was of shorter duration but reactions were mild.—T.E.G.R.

RIBEIRO, J. M. (1956) Le vaccin de la péripneumonie contagieuse des bovidés à partir de l'embryon de poulet. **[A chick embryo vaccine against bovine contagious pleuro-pneumonia in Portugal.]**—*Bull. Off. int. Epiz.* **46,** May. pp. 428-430. **3742**

The organism was grown on the chorio-allantoic membrane of chick embryo. There was no attenuation, and reactions set up in cattle by innoculation of a suspension of the membrane were identical with those produced by culture vaccine.—T.E.G.R.

GERLACH, F. & HEIKKILA, I. (1956). Passage du virus de la péripneumonie contagieuse des bovins, chez la souris blanche. **[Passage in white mice of the organism of bovine contagious pleuro-pneumonia.]** — *Bull. Off. int.*

Epiz. **46,** May. pp. 404-419. [English summary.] **3743**

The organism of bovine contagious pleuro-pneumonia was passaged in white mice. S/c injection of a live culture caused a marked local reaction but no symptoms of septicaemia and no mortality. Resorption of the swelling was slow but complete and no local damage or after-effects ensued. Reactions were more regular in white mice, which are considered more suitable than cattle for experimental purposes. Experiments on calves indicated that the organism had become adapted to the white mice. After 30 passages only mild reactions, if any, were observed in calves. The immunizing properties of the organism were not assessed.—T.E.G.R.

Irving, M. R. (1956). **Progress in the control of pleuro pneumonia in South Australia and the Northern Territory.**—*J. Dep. Agric. S. Aust.* **59,** 452-455. **3744**

An area of 400,000 sq. miles in South Australia and the Northern Territory has been proclaimed a bovine contagious pleuro-pneumonia "Protected Area." Although much of it is desert, this area carries over 400,000 cattle. It had been noted that the disease, after its introduction by cattle from the northern endemic areas, usually died out in the arid climatic conditions instead of becoming established. Cattle from the far north will now be allowed into Alice Springs district for immediate slaughter only, and cattle from east of the Great Lakes are prohibited from moving to the pastoral areas of South Australia.

Close liaison has been established between the Animal Industry organizations of the Northern Territory and South Australia. Prompt reporting of a case of pleuro-pneumonia in Alice Springs enabled the diversion of a consignment of cattle to Adelaide for immediate slaughter and prevented a possible outbreak in South Australia. Over 100,000 cattle from the Alice Springs district will be slaughtered in Adelaide during the next 2 years and autopsies should help in the detection of the disease.

After two years' freedom from the disease from the last case or last entry of infected cattle, the herds in this area will be considered disease-free and cattle will be permitted to move south. This should overcome the erratic beef supplies for Adelaide, which at present are subject to seasonal conditions in the north.

—I. G. Pearson.

Hyslop, N. St. G. (1956). **Foetal infection with contagious bovine pleuro-pneumonia following subcutaneous infection of the dam.**—*Vet. Rec.* **68,** 604-605. [Author's summary modified.] **3745**

Congenital infection of a calf is recorded following infection of the dam with bovine contagious pleuro-pneumonia. The progeny of two other vaccinated heifers failed to show signs of infection. The slight danger which may be inherent in the vaccination of cattle approaching full-term is discussed briefly.

Adler, H. E. & Yamamoto, R. (1956). **Preparation of a new pleuropneumonia-like organism antigen for the diagnosis of chronic respiratory disease by the agglutination test.**—*Amer. J. vet. Res.* **17,** 290-293. **3746**

The antigen was produced by the addition of yeast autolysate to broth culture supplemented with horse serum. Growth of the organism was enhanced by stirring if the surface area of the broth was small (*i.e.*, when narrow flasks were used). A cream separator was used for the concentration of antigen.—T.E.G.R.

Eissa, Y. M. (1956). La maladie respiratoire chronique des volailles en Egypte. [**Chronic respiratory disease of fowls in Egypt.**]—*Bull. Off. int. Epiz.* **46,** May. pp. 170-183. [English summary.] **3747**

An outbreak of a disease of the respiratory tract among young chickens, a few months after the importation of day-old chicks, was investigated. The symptoms were those of coryza, tracheitis, broncho-pneumonia, and air sac infection (with abundant caseous exudate in the thoracic and abdominal cavities). Pleuro-pneumonia-like organisms were isolated from the infected air sacs, nasal and pulmonary discharges.—T.E.G.R.

Jordan, F. T. W. (1956). **Some observations on respiratory disease in poultry.**—*Vet. Rec.* **68,** 554-558. **3748**

J. studied respiratory diseases of fowls on one farm during a year. Two clinical forms were observed. The first was an epidemic coryza, mainly affecting growing birds and rarely fatal. P.M. lesions were mild catarrhal inflammation of nares, trachea and sinuses. Pleuropneumonia-like organisms were isolated from 22 out of 38 samples of nasal or tracheal exudate. The second type was sporadic and invariably fatal, affecting mainly mature birds, and characterized by respiratory distress, or by depression and emaciation. A caseous or semi-solid pale yellow exudate was found in the larynx, trachea and bronchi, and there was often thickening of the walls of the air sacs. *Aspergillus fumigatus* was isolated from 12 out

of 27 samples of exudate. There was no evidence of *Pasteurella, Haemophilus* or Newcastle disease infection on the farm.—R.M.

JENSEN, R. G., SMITH, K. L., EDMONDSON, J. E. & MERILAN, C. P. (1956). **The characteristics of some rumen lactobacilli.**—*J. Bact.* **72,** 253-258. [Authors' summary modified.] **3749**

Of 168 cultures of lactobacilli isolated (2 from sheep rumen fluid and the rest from 8 samples from cattle), 155 were identified: 12 were *Lactobacillus acidophilus,* 5 *L. brevis,* 30 *L. buchneri,* 4 *L. casei,* 46 *L. casei* (non-lactose-fermenting), 6 *L. fermenti,* and 52 *L. plantarum.* Two cultures of *L. acidophilus* and *L. casei* were found in the sheep sample. All except *L acidophilus* and *L. casei,* were found in dilutions of 10^{-6} of 10^{-7}. The classification of the non-lactose-fermenting variety of *L. casei* is discussed. The methods of isolation are described.

BRYANT, M. P. & SMALL, N. (1956). **The anaerobic monotrichous butyric acid-producing curved rod-shaped bacteria of the rumen.** —*J. Bact.* **72,** 16-21. [Authors' summary modified.] **3750**

A study of strains of anaerobic curved rods from the bovine rumen indicated 4 distinct groups. The largest group comprised monotrichous, non-spore-forming, Gram-negative, curved rods that ferment glucose, producing large amounts of butyric acid. This group was placed in the new genus *Butyrivibrio.* Morphological and physiological characteristics varied widely among the 48 strains. A type species, *B. fibrisolvens,* was described on the basis of the characteristics of one of the most representative strains. This species ferments glucose. producing carbon dioxide, hydrogen, and butyric, formic and lactic acids. It ferments a large number of carbohydrates including hexoses, pentoses, disaccharides, glycerides and polysaccharides.

Members of the genus not placed in the type species differ mainly in the non-fermentation of several carbohydrates. One of the more variant strains differed from the type species in not producing hydrogen and in producing a larger amount of formic acid.

The genus *Butyrivibrio* is important because the strains digest many of the major components of ruminant food including xylan, cellulose, starch and protein, and appear to be among the most numerous bacteria present in the rumen of cattle and sheep fed a variety of rations.

See also absts. **3910** (role of thiamine, pyridoxine and pantothenic acid in natural resistance of rats to Corynebacterium infection); **3938** (mycotoxicoses); **3997** (report, National Institute of Research in Dairying); **3998** (report, Northern Rhodesia); **3999** (report, Mauritius).

DISEASES CAUSED BY PROTOZOAN PARASITES

HOARE, C. A. (1956). **Morphological and taxonomic studies on mammalian trypanosomes. VIII. Revision of *Trypanosoma evansi.*—*Parasitology*. 46,** 130-172. [Statistical analysis of measurements of *Trypanosoma evansi,* by Trevan, J. W., pp. 165-169.] **3751**

H. revises the morphology and taxonomy of the Surra group of trypanosomes with special reference to their affinities. The paper is therefore of zoological interest and importance to veterinary protozoologists. The material examined comprised 26 strains and four substrains of *Trypanosoma evansi* (*sensu lato*). Blood smears examined from camels, horses, mules, cattle, buffaloes, and dogs confirmed the essentially monomorphic character of *T. evansi;* only 0·05% of stumpy forms was detected in a total of 31,000 trypanosomes examined.

Three strains were maintained in mice and examined repeatedly over several years. One strain showed stumpy forms on four separate occasions over a 4-year period, another on 8 occasions over a 5-year period. This infrequency of occurrence of stumpy forms explains the low percentage observed when strains are examined only once. The third strain, however, examined during a 17-year period, showed stumpy forms on 250 occasions in proportions up to 61%. These observations confirm the polymorphism of *T. evansi.*

The frequency distribution of the lengths of the stumpy, intermediate and slender forms produced three distinct overlapping curves some of which were bi- or multi-modal.

A statistical analysis of the mean lengths of 22 typical monomorphic populations of different provenance revealed a statistically significant difference in about 50% of the pairs compared. However, it is concluded that these strains belong to the one species, *T. evansi.*

Typically *T. evansi* measures 15–34 μ with a mean of 24 μ. When the species exhibited polymorphism the mean measurements of the component forms were: stumpy 16·8–19·6 μ, intermediate 19·5–20·7 μ, slender 23·0–24·9 μ.

The physiological characteristics, antigenic constitution, clinical symptoms and response to

drug treatment are similar in the Brucei group (*T. brucei, T. rhodesiense, T. gambiense*) and in *T. evansi,* this indicating a close relationship. A revised diagnostic key is presented in which phylogenetically *T. evansi* is considered to be descended from *T. brucei.*

The statistical analysis revealed a variation in mean length of the different strains of *T. evansi* so large that this measurement was considered of little value in the diagnosis of the species There was also evidence of heterogeneity in the different populations studied and probably comprising more groups than the morphologically distinguishable slender, intermediate and stumpy forms, suggesting the presence of crops of different ages.—A. E. Pierce.

Watkins, T. I. & Woolfe, G. (1956). **Prophylaxis of trypanosome infections in cattle.** —*Nature, Lond.* **178,** 368. **3752**

An ethidium derivative, referred to as "R.D. 2801," protected cattle in Tanganyika and Nigeria from trypanosomiasis for at least 6 months when given as a single dose at 2 mg./kg. body wt. Trials are still in progress. —R.M.

Steinert, M. & Boné, G. J. (1956). **Induced change from culture form to blood-stream form in *Trypanosoma mega*.—*Nature, Lond.* 178,** 362. **3753**

Calf serum heated to 56°C. for 39 min. was added to slide cultures of *T. mega.* It agglutinated the crithidia without lethal effect, and 24 hours later numerous blood-stream forms appeared. Serum exposed at 0°C. to large numbers of crithidia had the same effect but without agglutination. Fractionation of the serum proteins indicated that the transformation was connected with the globulin fraction. —M.G.G.

Hess, E. (1956). Bekämpfung der Trichomonadenseuche, Behandlung infizierter Zuchtstiere. **[Control of trichomoniasis and the treatment of infected bulls.]**—*Schweiz. Arch. Tierheilk.* **98,** 205-210. [English, French and Italian summaries.] **3754**

The control of trichomoniasis in bulls is based on the examination of all animals in the herd and either slaughter or treatment of infected bulls. Treatment consists of relaxing the penis under local anaesthesia and spraying the exposed organ with 8 litres of a mixture of 3% hydrogen peroxide, 0·5% "Tego 103 S" (a detergent), and 1:1,000 "Penotrane" (a phenyl mercuric of the dinaphthylmethandisulphuric acid group). After treatment, sheath samples are examined culturally at intervals to ensure that the bull is free from infection before it is used for breeding.—E. J. L. Soulsby.

Kerr, W. R. & Robertson, M. (1956). **Partial immunological paralysis to *Trichomonas foetus* antigen in calves.**—*J. Hyg., Camb.* **54,** 415-418. [Authors' summary modified.] **3755**

I/m injection of large amounts, 2–3 g., of *Tr. foetus* crude antigen into 5 young calves during the first 3 weeks of life produced no antibody. When the animals were challenged with the standard challenge injections at intervals of several months they responded feebly, showing an impaired capacity to produce antibody, as compared with normal animals. The ages of the animals still with this partial "immune paralysis" ranged from 17 to 26 months.

Reusse, U. (1956). Die Ubertragung von *Trichomonas foetus* auf Laboratoriumstiere. **[Transmission of *Tr. foetus* to laboratory animals.]**—*Dtsch. tierärztl. Wschr.* **63,** 168-171. **3756**

The golden hamster can be satisfactorily infected with *Tr. foetus* by the intravaginal route. The animal remains infected for several months but shows no evidence of ill effects. Freshly isolated strains of *T. foetus* are superior to laboratory culture strains. The stock used for the infections should be examined for the naturally occurring *Tr. ardin-delteili.* —E. J. L. Soulsby.

Joyner, L. P. & Bennett, G. H. (1956). **Observations on the viability of *Trichomonas foetus* during the process of freezing to −79°C. and thawing in the presence of glycerol.** —*J. Hyg., Camb.* **54,** 335-341. [Authors' summary modified.] **3757**

It was confirmed that *Tr. foetus* fails to survive freezing and thawing in the presence of 10% glycerol in egg yolk-citrate diluent. Glycerol was only markedly toxic for *Tr. foetus* when in the presence of citrate. The percentage of spermatozoa surviving this treatment was satisfactory.

Costello, L. C. & DeVolt, H. M. (1956). **Studies on the chemoprophylactic action of furoxone against infectious enterohepatitis (blackhead) of turkeys.**—*Poult. Sci.* **35,** 952-955. [Authors' conclusions modified.] **3758**

Furazolidone in the food in concentrations of 0·011%, 0·0167% and 0·033% suppressed blackhead in turkeys, but did not prevent the formation of slight lesions in a few birds. Sus-

ceptibility to blackhead was lower when higher concentrations of the drug were given. During a period of 5 weeks, the drug did not significantly retard growth when given at 0·011% and 0·033%.

SCHLÜTTER, H. & QUERNER, H. (1956). Untersuchungen über eine vorbeugende Anwendung von Nitrofurazon (Furacin) gegen Kükenkokzidiose. [**Prevention of coccidiosis with nitrofurazone.**] — *Arch. Geflügelk.* **20,** 233-241. [English summary.] **3759**

Of 3 groups each of 100 chicks one received 0·0055% nitrofurazone in the food, the second 0·00734%, and the third served as a control. During a period of 8 weeks there were 3 deaths from coccidiosis in the control group and blood-stained faeces were seen. Coccidiosis did not occur in the treated groups and the weight gains and food conversion efficiency were greater.

—M.G.G.

ENIGK, K. (1956). Die Schafpiroplasmose in Deutschland. [**Piroplasmosis in sheep in Germany.**]—*Dtsch. tierärztl. Wschr.* **63,** 161-162. **3760**

Piroplasmosis due to *Babesia motasi* and *Theileria recondita* is recorded in sheep in central and north western Germany. *Ixodes ricinus* was shown experimentally to transmit *B. motasi* and probably also *T. recondita.* The latter parasite is non-pathogenic but the former causes marked cachexia; however, deaths are infrequent.—E. J. L. SOULSBY.

ENGLERT, H. K. & KARLE, L. (1956). Endemische Toxoplasmose bei Feldhasen im Schwarzwald. [**Endemic toxoplasmosis in hares in the Black Forest, Germany.**] — *Dtsch. tierärztl. Wschr.* **63,** 163-168. **3761**

During the severe winter of 1954–55 an outbreak of toxoplasmosis appeared in field hares in south western Germany. A detailed account is given of the pathology and histopathology, and this is differentiated from *Pasteurella pseudotuberculosis* and *Brucella tularensis* infections.—E. J. L. SOULSBY.

DA GRAÇA, H. M. (1956). Le traitement de l'anaplasmose bovine. [**Treatment of anaplasmosis.**]—*Bull. Off. int. Epiz.* **46,** May. pp. 593-595. **3762**

Anaplasmosis in 24 cattle was successfully treated with 100 ml. of 0·5% resoquine soln. [chloroquine] injected i/v, followed by a second similar injection 24 hours later together with an i/m injection of 1 g. of pentamidine. If an animal did not improve within 24 hours, it received 3–4 litres of citrated blood and double doses of resoquine daily, and a second injection of pentamidine.—M.G.G.

CUTCHINS, E. C. & WARREN, J. (1956). **Immunity patterns in the guinea pig following *Toxoplasma* infection and vaccination with killed *Toxoplasma*.**—*Amer. J. trop. Med. Hyg.* **5,** 197-209. [Authors' summary slightly modified.] **3763**

Guinea-pigs inoculated with an aqueous suspension of killed *Toxoplasma* developed dye-test antibody but not complement-fixing antibody. When an adjuvant was combined with the antigen both antibodies developed and considerable immunity resulted. The antigen was apparently associated with the whole organism rather than extracts of it, even though extracts actively fixed complement. Convalescent animals resisted intracerebral inoculation of *Toxoplasma* but vaccinated animals did not. Toxoplasms were disseminated throughout the body of the g. pig even in the presence of really high levels of c.f. antibody.

SMITH, C. H. (1956). **Experimentally induced ocular toxoplasmosis in rabbits.**—*Brit. J. exp. Path.* **37,** 248-252. [Survey of paper (p. i) slightly modified.] **3764**

S. produced retinal toxoplasmosis in rabbits by injection into the vitreous of a strain of toxoplasma isolated from a fatal human case in which there was an acute choroidoretinitis. The organism was demonstrable in the lesions of the rabbits and could be recovered from them.

EYLES, D. E., COLEMAN, N. & CAVANAUGH, D. J. (1956). **Preservation of *Toxoplasma gondii* by freezing.**—*J. Parasit.* **42,** 408-413. [Abst. from authors' summary.] **3765**

After slow freezing in glycerol solutions *T. gondii* survived in the frozen state for up to 209 days. Very slow freezing in 5–10% glycerol was best. The initial loss of viability after freezing was high, but storage at below −70°C. resulted in little further loss over the period tested. Rapid thawing for a few minutes in a water bath at 37°C. was carried out. It is suggested that this technique could replace serial passage in animals with its attendant hazards and disadvantages.

FIEDLER, C. (1956). Differentialdiagnostische Betrachtung über eine selten vorkommende Art von Verkalkung bei Miescherschen Schläuchen. [**Differential diagnosis of calci-**

fied Miescher's tubes and *Trichinella.*] — *Arch. Lebensmittelhyg.* **7,** 183-184. **3766**

A calcified cyst, apparently containing remnants of a trichinella, was found on the border of a muscle fibre in a yearling pig. It was diagnosed as a sarcocyst on account of the age of the pig and absence of further calcified cysts. —M.G.G.

Sedlemeier, H. & Dahme, E. (1955). *Pneumocystis carinii* Infektion beim Hund. [*Pneumocystis carinii* **infection in a dog.**] — *Zbl. allg. Path. path. Anat.* **93,** 150-155. **3767**

Bodies resembling *Pneumocystis carinii* were present in lesions in the lungs and heart muscle of a puppy which died from pneumonia. They took the form of multinuclear cysts. Differentiation from *Toxoplasma* and *Histoplasma* was described. The authors discussed the relationship of this condition to *P. carinii* pneumonia in children.—R.M.

See also abstr. **3998** (report, Northern Rhodesia).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Anon. (1955). Great Britain. **The Foot-and-Mouth Disease Research Institute. Report for the years 1954-1955.** pp. 22. Pirbright: The Institute. 1s. **3768**

It is again stressed that an animal that has recovered from infection with one type of the virus can develop the disease from infection with any other type. The determination of the type of virus responsible for any outbreak has a fundamental bearing on the control of the disease in Great Britain and elsewhere. By far the most important work is to identify the virus type in countries where vaccination is relied upon for control.

It has been found that the unweaned mouse is susceptible to F. & M. disease on about the same level as cattle and this has opened up a very useful field for tests. Much attention has been given to the study of the virus, which has a complicated structure.

The method of preparing vaccine grown on tongue tissue has been studied. A mobile laboratory has been set up; it is fully equipped to collect tongue tissue from any abattoir in the country.

In Great Britain the period since January 1953 has been one of low incidence of the disease; 32 samples of virus were examined in 1953, only 10 in 1954 and 6 in 1955. During the same period samples of virus have been received from Angola, Mozambique, Zanzibar, Tanganyika, Kenya, Egypt, the Republic of the Sudan, Nigeria, Northern Rhodesia, Southern Rhodesia, South Africa, Syria, Jordan, the Lebanon, Iraq, India, Pakistan, Ceylon, Siam, Hong Kong, Uruguay and Venezuela.

Following the widespread outbreaks of vesicular exanthema in the U.S.A. there has been a renewed interest in research on that virus.

A list of publications from the Institute, 1953–55 is appended.—D. S. Rabagliati.

Palacios García, C., Félix Palacios, L. & Fuentes Marins, R. (1955). Adaptacion del virus de la fiebre aftosa tipo "O" Vallée (Cepa Lara) a pollos de un dia de edad. **[Adaptation of type O foot and mouth disease virus to day-old chicks.]**—*Bol. Inst. Invest. vet. Caracas.* **7,** No. 23. 14-33. [English summary.] **3769**

Fifteen passages of the virus were made through day-old chicks, by intratracheal injection. For the first two passages the chicks were killed at between 4 and 7 days, but thereafter the chicks died at times varying from 15–168 hours after infection, and virus was recovered principally from the liver and gizzard. A limited study of the infective power of the virus for cattle and lactating mice showed a decrease in the 3rd and 7th passages and an increase in the 15th passage.—I. W. Jennings.

Brooksby, J. B. & Erichsen, S. (1956). **A non-specific complement-fixing system in foot-and-mouth disease and experiments on the absorption of heterologous antibody from serum.** — *J. Hyg., Camb.* **54,** 328-334. [Authors' summary modified.] **3770**

Stored mixtures of F. & M. disease virus and the corresponding antisera have equal complement-fixing activity whether they are prepared from virus and serum of homologous or heterologous types. Ultracentrifugation removes the activity from the mixture and the remaining antibody is more type-specific in routine c.f. tests than the original serum.

Karstad, L. H., Adams, E. V., Hanson, R. P. & Ferris, D. H. (1956). **Evidence for the role of wildlife in epizootics of vesicular stomatitis.** — *J. Amer. vet. med. Ass.* **129,** 95-96. [Abst. from authors' summary.] **3771**

In south eastern Georgia, 72 of 118 rac-

coons, deer, and wild swine had high titres of neutralizing antibody against vesicular stomatitis virus, New Jersey type.

PATTERSON, W. C., JENNEY, E. W. & HOLBROOK, A. A. (1956). **Experimental infections with vesicular stomatitis n swine.**—*Proc. 59th Ann. Meet. U.S. live Stk sanit. Ass.* 1955. 368-378. **3772**

Two pigs which were inoculated i/v with vesicular stomatitis virus transmitted infection to healthy pigs between 12 and 144 hours later. Pigs in contact with them after this period remained healthy. Healthy pigs which had been scarified on the snout and forefeet became infected after eating meat scraps from diseased pigs: intact pigs did not. The virus was isolated from the saliva but not from the urine and faeces of infected pigs.—M.G.G.

NIKOLIĆ, M. & JELESIĆ, Z. (1956). **Isolation of rabies virus from insectivorous bats in Yugoslavia.**—*Bull. World Hlth Org.* **14,** 801-804. **3773**

Rabies was demonstrated in 3 *Nyctalus noctula* insectivorous bats by serum neutralization tests in mice. Rabbits and g. pigs were also infected experimentally. The incubation period in g. pigs was from 2½ to 3½ days. Negri bodies were not found but there was clinical and histological evidence of meningo-encephalitis.—M.G.G.

HABEL, K. (1956). **Effect of immunity to challenge and antibody response of variation in dosage schedule of rabies vaccine in mice.** — *Bull. World Hlth Org.* **14,** 613-616. [French summary. Author's synopsis modified.] **3774**

Mice were immunized with the same total quantity of virus irradiated with ultra-violet rays and given i/p in varying amounts at varying intervals. Their sera were tested for neutralizing antibodies immediately before challenge with intracerebral inoculation of fixed virus. All dosage schedules produced immunity and good antibody levels. Twelve daily doses gave no better results than the same amount in 3 or 4 doses. A dose on or after the 10th day of immunization seemed to heighten the effect of earlier doses.

ATANASIU, P., BAHMANYAR, M., BALTAZARD, M., FOX, J. P., HABEL, K., KAPLAN, M. M., KISSLING, R. E., KOMAROV, A., KOPROWSKI, H., LÉPINE, P., PÉREZ GALLARDO, F. & SCHAEFFER, M. (1956). **Rabies neutralizing antibody response to different schedules of serum and vaccine inoculations in non-exposed persons.**—*Bull. World Hlth Org.* **14,** 593-611. [French summary.] **3775**

The 11 schedules were each tested on a group of 10 people. Only the group which received hyperimmune serum followed by 12 daily injections of phenol vaccine had antibody in the blood throughout the experimental period of 28 days. In the groups which received hyperimmune serum alone, or serum and Flury vaccine (which induced no antibody formation), the antibody level declined after the 10th day but was present in most individuals on the 21st day.—M.G.G.

ILERI, S. Z. (1956). Comparaison des propriétés immunisantes d'une souche locale du virus de la diphtérie aviaire, adaptée à l'embryon de poulet, avec celles de la souche Beaudette. **[Fowl pox vaccines.]** — *Bull. Off. int. Epiz.* **46,** May. pp. 492-497. [English summary.] **3776**

Two egg-adapted fowl pox vaccines, one prepared by the author from a local strain, were given to fowls by comb and follicle scarification. Both vaccines conferred immunity lasting until 18 months later, when 7 of a group of 15 birds reacted to challenge.—M.G.G.

I. DOROSHKO, I. N., PODGORODETSKI, N. P. & SADOVSKAYA, L. I. (1954). **[Field trials with U.I.E.V. vaccine against fowl pox.]**—*Nauch. Trud. ukrain. Inst. exp. Vet.* **21,** 34-52. [In Russian.] **3777**

II. DOROSHKO, I. N., PODGORODETSKI, N. P. & SADOVSKAYA, L. I. (1955). **[Further field trials with U.I.E.V. vaccine against fowl pox.]**—*Ibid.* **22,** 45-59. [In Russian.] **3778**

I. & II. The vaccine prepared at the Ukrainian Institute for Experimental Veterinary Science (U.I.E.V.) contained a live, stable attenuated variant of fowl pox virus obtained "by selection" [details not given]. The vaccine was prepared from the skin of adult pigeons, collected 6–7 days after scarification with the virus; 6–12 g. of crude virus suspension were obtained from each pigeon. Trials with 400,000 fowls, turkeys and pigeons, vaccinated by scarification, proved the vaccine to be safe and effective; protection lasted for 6 months, and the virus did not spread from vaccinated to unvaccinated birds by contact. It retained its activity after storage for 2 years at 5° to 10°C., and was more resistant than pigeon pox virus to high environmental temperatures.—R.M.

BURNET, F. MACFARLANE. (1956). **Structure of influenza virus.** — *Science.* **123,** 1101-1104. **3779**

Influenza virus A–PR8 particles in allantoic fluid are mainly spherical, with an average diameter of 82 mμ; filament forms of diameter approx. 70 mμ and length 20 or 30 μ also occur, though very rarely. The chemical composition is similar to that of cytoplasm from animal cells.

Within the particle, there is a variable number, between 5 and 60, of genetic units, probably ribose nucleic acid–protein complexes. From genetic studies it is believed that these may show qualitative differences of types broadly similar to what is postulated for chromosomal behaviour in higher forms.

The virus particle appears to be a loosely organized unit enclosed in a membrane derived largely from the host cell; that it is not a highly standardized structure is indicated by (i) the variable diameter of spheres and the alternate filamentous morphology; (ii) the existence of varying degrees of incompleteness with evidence of morphological and chemical variation in relation to this; (iii) the existence of phenotypic mixtures in the progeny of mixed infections; and (iv) the redistribution of virulence when certain pairs of virulent and avirulent strains produce recombinants.—E.V.L.

HAMMON, W. McD., SATHER, G. E., LENNETTE, E. H. & REEVES, W. C. (1956). **Serological response to Japanese B encephalitis vaccine of children and horses immune to St. Louis virus.**—*Proc. Soc. exp. Biol., N.Y.* **91,** 517-521. **3780**

Cross immunity between St. Louis and Japanese B encephalitis was observed in children and horses immune to St. Louis virus. This phenomenon is attributed to an antigen common to the two viruses and, possibly, to other viruses in the group. It is considered that such natural active immunity may serve as a basis for immunization against other members of the group by stimulation with a killed virus vaccine.—T.E.G.R.

SPRYSZAK, A. & KRAUSS, S. (1956). Odczyn Coomb's w niedokrwistości zakaźnej koni. **[The Coombs test in equine infectious anaemia.]** — *Méd. vét., Varsovie.* **12,** 393-395. [In Polish. English and Russian summaries.] **3781**

The Coombs test, on blood samples from 20 horses suspected of equine infectious anaemia, from 2 experimentally infected horses and from healthy controls, yielded inconclusive results.—M. GITTER.

OLEĬNIK, N. K., YAZVIKOVA, K. N., DIRENKO, P. M. & MALYARETS, P. V. (1955). **[Biological tests on pigeons for the diagnosis of equine infectious anaemia.]** — *Nauch. Trud. ukrain. Inst. exp. Vet.* **22,** 15-32. [In Russian.] **3782**

Pigeons were inoculated with blood from the horse under test, and about 3 blind passages were carried out. The result of the test was decided by a comparison of a haemagglutination test on the blood and histological examination of the organs. Details of the test procedure are not given, because they were reported by Oleĭnik *et al.* in 1951 (*Ibid.* **18**) and 1952 (*Ibid.* **19**). When the result of the test did not correspond with clinical or epidemiological findings, it was repeated.

The results of tests of 257 horses are given in detail. 70 out of 91 clinical cases of equine infectious anaemia were positive; so were 23 out of 70 suspected cases; 12 out of 66 apparently healthy horses, and 4 out of 30 horses with other diseases.—R.M.

QUINLAN, J. (1956). **Influenza in race-horses.** —*J. S. Afr. vet. med. Ass.* **27,** 1-6. **3783**

Q. described an acute, febrile, contagious disease similar to, though less virulent than, influenza in racehorses in S. Africa. It was a septicaemia, probably caused by a filtrable virus. The value of the animals precluded transmission experiments; there was no fatal case and therefore no P.M. examination. The incubation period was about 2 days; the symptoms were high temperature, lethargy, increased respiration rate, tracheitis and bronchitis, complete inappetence, oedema of the legs, cloudy urine and muco-purulent conjuctival and nasal exudates. Cases treated in the early stages recovered rapidly, the horses being then rested for 2 to 4 weeks. Early differential diagnosis from piroplasmosis was of importance. —E.V.L.

THIÉRY, G. (1956). Influence du type de virus et de l'espèce affectée sur les lésions de la peste bovine. **[Influence of strain of virus and of species of host on the lesions of rinderpest.]**—*Rev. Élev.* **9,** 109-115. [English and Spanish summaries.] **3784**

This is an important study of the lesions of rinderpest as seen in cattle, goats and rabbits in French West Africa. The author stresses the fact that the severity of the lesions is proportional to the condition of the affected animals. In thin wasted animals the lesions are poorly developed while in animals in good condition they are well marked. This is a point which the abstractor does not remember to have seen brought out in any other published description of the lesions of rinderpest but it is an observa-

tion which he (the abstractor) can confirm from past experience.

The goats used by the author did not show any mouth, gastric or intestinal lesions when infected with a goat-adapted virus. [In Ceylon naturally affected goats had mouth, gastric and intestinal lesions identical with the characteristic lesions seen in cattle (—Abst.).] Some of the goats had discrete pneumonic lesions which the author considered not to be caused by the rinderpest virus but by secondary bacterial infection. [This was also considered to be the case in Ceylon (Abst.).]

The author is of the opinion that the only lesions directly caused by the rinderpest virus are the ulceration of the buccal, oesophageal and ruminal mucous membranes, the necrosis of the abomasal mucosa, the congestion and enlargement of the lymph nodes and skin lesions seen in some cases. The ileo-caecal and other intestinal lesions so often seen in rinderpest he does not consider to be caused directly by the virus. These he considers to be manifestations of the stress syndrome. Many workers will probably disagree with this opinion.

An interesting observation was that the lesions were much better developed in rabbits which had received in their ration an excessive supplement of vitamin D_2. No mention is made of lesions in the vulva and vagina as the animals studied were all males.

This article should be read in the original by all workers concerned with rinderpest.

THIÉRY, G. (1956). Hématologie, histopathologie et histochimie de la peste bovine. Intérêt de l'étude histochimique des inclusions cellulaires de la peste bovine pour la signification générale des inclusions dans les maladies à virus. [**Haematological and histological studies of rinderpest with special reference to cellular inclusion bodies.**] — *Rev. Élev.* **9**, 117-140. [English and Spanish summaries.] **3785**

This is a detailed study which is difficult to abstract; it should be read in the original. Haematological, histological and histo-chemical methods have been used. T. considers that his histological findings confirm his view [preceding abst.] that some of the macroscopic lesions associated with rinderpest are not specific. The role of the lymphocytes and polymorphonuclear leucocytes is discussed. Acidophilic cytoplasmic inclusion bodies which are claimed to be specific are described in numerous organs especially in the tonsils.

MORNET, P., ORUE, J. & GILBERT, Y. (1956). Unicité et plasticité du virus bovipestique. A propos d'un virus naturel adapté sur petit ruminants. [**Variability of rinderpest virus, with reference to a strain naturally adapted to small ruminants.**] — *C.R. Acad. Sci., Paris.* **242**, 2886-2889. **3786**

The immunological identity of strains of rinderpest virus, no matter from what species of animal or from what geographical area they are obtained, is pointed out.

A disease of sheep and goats not previously reported is described. This disease spreads rapidly in flocks of sheep or goats; the clinical signs and lesions are the same as those of rinderpest as it occurs in cattle. It seems to be caused by a virus which is non-pathogenic for cattle but which immunizes cattle against rinderpest; it can be neutralized by anti-rinderpest serum. The disease has occurred in French West Africa in recent years. Its possible nature and importance are discussed.

MORNET, P., GILBERT, Y., ORUE, J. & THIÉRY, G. (1955). Nouvelles recherches sur le virus-vaccin bovipestique lapinisé. [**Studies on the lapinized rinderpest vaccine.**]—*Rev. Élev.* **8**, 297-310. **3787**

A description is given of the titration of lapinized rinderpest virus in fresh and freeze-dried rabbit tissues. Fresh material may contain up to 5 million infective doses for the rabbit and the loss of virus on drying is claimed to be not more than 20%. From titrations it is shown that in theory 150 infectious rabbit doses are required to equal one immunizing dose for the ox and that each rabbit may provide enough dry virus to immunize 700 cattle.

Experiments show that, after injection of virulent material, virus could be detected in rabbits not earlier than 10 hours, that the maximum titre is found at 63 hours and that virus may be recovered up to 15 days.

A description of the histopathology in the rabbit is given with reference to various stages in the lymphoid tissues; an initial role is ascribed to the polymorphonuclear leucocytes.

There is a warning of the special attention required for the production and freeze-drying of such a fragile virus under tropical conditions.

The authors provide confirmation of previous work and compare their results with those of other workers in the field. Their claim to a loss of only 20% of virus after freeze-drying could prove to be a great advance but would be more convincing were the technique of titra-

tion more accurate with greater numbers of rabbits per dilution than two.

—J. G. BROTHERSTON.

SWOPE, R. E. & LUEDKE, A. J. (1956). **A mucosal disease in cattle in Pennsylvania.**—*J. Amer. vet. med. Ass.* **129,** 111-115. [Authors' summary modified.] **3788**

Mucosal disease was diagnosed in a herd of 20 cattle, it is believed for the first time in Pennsylvania. Lesions were largely confined to the epithelium of the digestive tract, with erosions of the mucosa of the oral cavity and oesophagus, and hyperplasia, cystic degeneration, circulatory disturbances, and erosion of the gastro-intestinal lining. The most severe lesions were in the distal portion of the ileum, the caecum, and the proximal end of the colon. Cystic lesions were also found in the gall-bladder and kidney. The numerous mucosal cysts in the maxillary sinus, the wart-like proliferations in the rumen wall of one animal, and the intracellular inclusion bodies in the oesophageal epithelium in another animal are lesions not previously reported in mucosal disease. Transmission by direct contact and by inoculation of lesion material into susceptible animals was unsuccessful.

HOAG, W. G., ROONEY, J. R., JR. & WILLIAMS, W. J. (1956). **A mucosal-type disease in cattle in Virginia.**—*J. Amer. vet. med. Ass.* **129,** 105-110. [Authors' summary modified.] **3789**

A mucosal-type disease occurred in young cattle in two widely separated herds. Differences between this disease and other mucosal diseases, viral diarrhoeas, and upper respiratory syndromes were discussed. Gross liver damage and severe lameness with interdigital erosions were constant and prominent findings. The agent was transmitted by spleen and blood filtrates to susceptible calves and produced a mild form of the disease in the absence of secondary bacterial invaders. The stress of weaning may have increased susceptibility since older cattle and young calves did not become infected.

RICHARDS, S. H., SCHIPPER, I. A., EVELETH, D. F. & SHUMARD, R. F. (1956). **Mucosal disease of deer.** — *Vet. Med.* **51,** 358-362. [Abst. from authors' summary and conclusions.] **3790**

A disease of white-tailed deer and mule deer was studied. P.M. examination of both species revealed catarrhal, ulcerative and haemorrhagic inflammation of the mucous membranes. In certain respects the symptoms resembled those of mucosal disease in cattle. Experimental transmission of the disease from deer to deer, and deer to antelope, and of mucosal disease of cattle to deer, produced similar symptoms and lesions.

WHEELER, C. E. & CAWLEY, E. P. (1956). **The microscopic appearance of ecthyma contagiosum (orf) in sheep, rabbits, and man.**—*Amer. J. Path.* **32,** 535-545. [Abst. from authors' summary.] **3791**

Inoculation of the virus of pustular dermatitis into the skin of sheep, rabbits, and man produces lesions differing in many respects. In sheep, ballooning degeneration and the formation of superficial, multiloculated vesicles and pustules are characteristic of the early phases of the disease, and granulomatous and papillomatous features predominate in the later phases. The disease in rabbits does not show ballooning degeneration and lacks the pronounced granulomatous or papillomatous character of the lesions in sheep. Lesions in man are usually characterized by vesiculation, which is a result of ballooning degeneration of the cells of the prickle layer, but a granulomatous character occasionally dominates the microscopic appearance.

KAUKER, E. & MINNERS, P. (1956). Virusabort des Schafes und Versuche zur Bekämpfung mittels einer Formol-Vakzine. **[Control of virus abortion in sheep with a formol vaccine.]** — *Berl. Münch. tierärztl. Wschr.* **69,** 265-267. [English summary.] **3792**

Virus abortion in sheep was demonstated in 9 flocks in Hessian, Germany. Out of 1,133 pregnant ewes 255 aborted. Two flocks were treated with a s/c injection, followed by a second 14 days later, of a formol vaccine prepared from the organs of aborted foetuses. Within 10 days after the first injection abortions ceased.—M.G.G.

MONREAL, G. & FRITZSCHE, K. (1956). Ein Behandlungsversuch des Virusabortes der Schafe. **[Treatment of virus abortion in sheep with chloramphenicol.]** — *Tierärztl. Umsch.* **11,** 172-173. **3793**

During an outbreak of virus abortion, 10 out of 50 pregnant sheep were tentatively treated with a s/c injection, followed by a second phenicol in oil, given i/m and s/c in a dosage of 2–4 g. This was well tolerated and appears to have produced encouraging results, since none of the treated sheep aborted (although weak lambs were produced by those that were

first to lamb after treatment), while among the untreated remainder abortion occurred in 15 cases.—G. P. MARSHALL.

HENDERSON, G. N. (1956). **An attempt to treat scrapie in the sheep with massive doses of vitamin B_{12}.**—*Vet. Rec.* **68,** 607-608. [Abst. from author's summary.] **3794**

An account of an attempt to treat scrapie in sheep with massive i/m injections of vitamin B_{12}. All the severely affected sheep died during treatment. It was concluded that the vitamin has no effect on the disease.

SCHELLNER, H. & RAUSCHER, W .(1956). Leukopenie als diagnostisches Hilfsmittel bei der Schweinepest. [**Leucopenia as a diagnostic aid in swine fever.**]—*Berl. Münch. tierärztl. Wschr.* **69,** 145-146. [English summary.] **3795**

Seventeen pigs were inoculated with swine fever virus. On the first day of clinical symptoms the w.b.c. count had fallen to below 8,000 per cu. mm. in 10 animals and to below 10,000 in 4 others. On the second day it was below 8,000 in 15 and below 10,000 in the other 2 pigs.—M.G.G.

LEEMANN, W. (1956). La lutte contre le peste porcine en Suisse. [**Control of swine fever in Switzerland.**]—*Bull. Off. int. Epiz.* **46,** May. pp. 122-133. [English and German summaries.] **3796**

The various methods of immunization used in Switzerland since 1940 are discussed. Each method gave satisfactory results and contributed towards the effective control of the disease. Their respective disadvantages are pointed out. With the serum-virus method the pigs are a source of danger as they excrete virus for 4–6 weeks. With crystal violet vaccine immunity takes 2–3 weeks to develop; the simultaneous use of serum is impossible and the vaccine cannot, therefore, be used on infected premises. Lapinized vaccine confers a solid immunity after 7 days but produces leucopenia which renders the animals susceptible to bacterial diseases. In the circumstances, crystal violet vaccine is considered to be the method of choice.—T.E.G.R.

KOVALENKO, J. R. (1956). La vaccination contre la peste porcine en U.R.S.S. [**Swine fever immunization in Russia.**] —*Bull. Off. int. Epiz.* **46,** May. pp. 147-152. [English summary.] **3797**

A crystal violet vaccine prepared from a local strain of virus is used in the U.S.S.R.
—T.E.G.R.

VAN WAVEREN, G. M. (1956). Vaccination contre la peste porcine à l'aide des vaccins lapinisés. [**Lapinized swine fever vaccine.**] —*Bull. Off. int. Epiz.* **46,** May. pp. 102-121. [English summary.] **3798**

In a study on lapinized vaccine it was observed that pigs at any age quickly developed a solid lasting immunity. It was also observed that the vaccine virus is highly pathogenic for young pigs and, especially, unborn ones. This virulence was not diminished by the simultaneous use of hyperimmune serum. It is suggested that the use of this vaccine should be under the direct control of the Veterinary Service, and limited to pigs on recently infected farms and pigs exposed to infection. It is not considered advisable to use it on pregnant sows.
—T.E.G.R.

SHOU SHEN YOUNG. (1956). Récents progrès dans la lutte contre la peste porcine au moyen du vaccin lapinisé, réalisés à Taiwan, Chine. [**Use of lapinized swine fever virus vaccine in China.**]—*Bull. Off. int. Epiz.* **46,** May. pp. 341-343. **3799**

Lapinized vaccine is becoming increasingly popular in Taiwan, mainly because it is cheaper than crystal violet vaccine and confers a solid immunity, established about the 4th day and lasting 12 months. The virulence of the lapinized virus was tested by passage in pigs. At the 5th passage there was no mortality among pigs; there were a few deaths between the 6th and 9th passage; while at the 10th–12th passage all the pigs under test died. Between Feb. 1954 and Feb. 1956, the number of pigs vaccinated was 1,765,949. Of these, 61,830 had an elevated temp. for 1–3 days and 9,391 died from swine fever or other complications. The usual control measures were also applied.
—T.E.G.R.

RÖHRER, H. (1956). Prophylaxie spécifique de la peste porcine au moyen du vaccin au cristal-violet. [**Crystal violet swine fever vaccine.**]—*Bull. Off. int. Epiz.* **46,** May. pp. 329-334. **3800**

A heavily infected district in Central Germany was chosen for a mass vaccination trial with crystal violet vaccine. Before vaccination about a fifth of the pig population of 25,000 was affected with swine fever and had to be slaughtered. A few weeks after vaccination the region was free and has remained so ever since. Losses from vaccination were 0·15% and mostly due to heart failure. It is considered that vaccination, in combination with veterinary police

measures, is an effective method of control of swine fever.—T.E.G.R.

DOYLE, T. M. (1956). **Simultaneous inoculation of swine fever serum and crystal violet vaccine.**—*Vet. Rec.* **68,** 431-433. **3801**

Twenty pigs were each inoculated simultaneously with 1 ml. crystal violet vaccine, given s/c into the ear, and 30 ml. swine fever immune serum, given i/m. Between 5 and 106 days after inoculation half were inoculated s/c with 1,000 M.L.D. swine fever virus, and half were placed in contact with infected pigs. Of the group challenged with virus, one challenged on the 19th day and another challenged on the 83rd day died from swine fever. Of the other group, 4 pigs died following contact at 14, 24, 83 or 106 days after inoculation. The immunity conferred did not appear to last longer than 60 days; because of the labour involved the method could be recommended only when valuable pigs were threatened by infection. To obtain consistent results it would be necessary to know the minimum protective dose of each batch of serum in relation to body weight of the pig, and this information is not usually supplied by the manfacturers of immune serum. [See also *V.B.* **23,** 2274.]—R.M.

JOHNSTON, R. V. (1956). **New developments in hog cholera immunization.**—*J. Amer. vet. med. Ass.* **129,** 142-146. **3802**

J. described the development and characteristics of a lapinized swine fever vaccine, which was stated to be highly effective and safe. The virus did not persist in vaccinated pigs and infection was not transmitted from vaccinated to unvaccinated ones. It was well tolerated when administered simultaneously with cortisone.—E.G.

SMITH, H. R., FERGUSON, L. C. & SANGER, V. L. (1956). **The effect of high levels of aureomycin (chlortetracycline) in the ration on development of immunity following vaccination against hog cholera.**—*J. Amer. vet. med. Ass.* **129,** 162-166. **3803**

Pigs, fed chlortetracycline at the rate of 100, 200 and 400 g./ton of food 18 days before and 26 days after vaccination with attenuated live swine fever virus gained more weight and tolerated vaccination better than untreated controls.—E.G.

VELHO, E. L. (1956). Observations sur la peste porcine en Angola. [**African swine fever in Angola.**]—*Bull. Off. int. Epiz.* **46,** May. pp. 335-340. **3804**

The conclusions arrived at as a result of 2½ years' study of swine fever in Angola are reported. The disease is caused by a highly pathogenic filtrable virus which differs from that of European swine fever. The virus was passaged 85 times in rabbits. At the 10th, 20th, 25th and 26th passages it caused chronic, lethal infection with the characteristic lesions in pigs. Virus was passaged in chick embryos over 24 successive passages. There was diminished virulence up to the 12th passage with a protracted course leading to death and with lesions of chronic infection; the few survivors had no resistance against experimental infection with the African virus. The chronic form of the disease was also encountered. Swine fever in Angola does not seem to be complicated by *Pasteurella* or *Salmonella* infections. It was not possible to prove antigenic relationship between the viruses of European and of African swine fever.—T.E.G.R.

BÖRNFORS, S. & LANNEK, N. (1956). **Treatment of enzootic pneumonia (virus pneumonia) in pigs with tetracycline: failure to remove the virus from an already established infection.** — *Vet. Rec.* **68,** 602-604. [Abst. from authors' summary.] **3805**

Therapeutic doses of tetracycline given for 10 and 14 days respectively to spontaneously and experimentally infected pigs did not make the animals non-infective. The pneumonic lesions were no less severe than those in control animals treated with penicillin and streptomycin.

CHI'EN LIU & COFFIN, D. L. (1956). **A study of canine distemper in ferrets and dogs by means of fluorescent antibody.** — *Fed. Proc.* **15,** 600. **3806**

In both ferrets and dogs, two days after intranasal infection the viral antigens were detectable in the cervical lymph nodes. Subsequently the antigens were traced to the mediastinal lymph nodes, mesenteric lymph nodes and spleen. A week later they were present in the epithelium of alimentary, urinary and respiratory systems. A rapid diagnosis could be made by examining blood smears or from conjunctival smears. During early infection the viral antigens usually appeared as fine intracytoplasmic fluorescent granules; as infection progressed, the antigens aggregated to form large oval objects in the cytoplasm.—W. MANSI.

CABASSO, V. J., SCHROEDER, C. R. & STEBBINS, M. R. (1956). **Isolation of distemper virus from the South American maned wolf (*Chrysocyon jubatus*).** — *Vet. Med.* **51,** 330-332. **3807**

Two maned wolf cubs died after being placed with a bitch and her two puppies. P.M. examination revealed catarrhal enteritis with haemorrhage in the lower gastro-intestinal tract, haemorrhagic areas in the liver, pulmonary haemorrhage, and swelling and congestion of the kidney. Puppies and ferrets inoculated with spleen and liver suspension developed typical distemper, while immune ferrets remained healthy.—M.G.G.

I. Martin, L. A. & Goret, P. (1955). Recherches sur le virus de Rubarth. III. Encéphalite du chien à virus de Rubarth. [**Studies on the virus of canine hepatitis. III. Encephalitis in dogs caused by the canine hepatitis virus.**]—*Arch. Inst. Pasteur Maroc.* **5**, 45-48. **3808**

II. Martin, L. A. & Delage, B. (1955). Recherches sur le virus de Rubarth. V. Infection inapparente spontanée du singe cynocéphale *Papio papio* (Desm.) au virus de Rubarth. [**Studies on the virus of canine hepatitis. V. Inapparent spontaneous canine virus hepatitis in the baboon *Papio papio*.**]—*Ibid.* 56-59. **3809**

III. Delage, B. & Martin, L. A. (1955). Recherches sur le virus de Rubarth. VI. Infection inapparente de l'homme par le virus de Rubarth. [**Studies on the virus of canine hepatitis. VI. Inapparent infection in man by the canine hepatitis virus.**] — *Ibid.* 60-63. **3810**

I. It is possible that an accute encephalitis in dogs experimentally infected with the virus of canine hepatitis may exist. The attention of practitioners is drawn to this type of encephalitis which may occur in the field and possibly be mistaken for rabies. A sound diagnosis can be made only by laboratory test.

II. It is possible that the virus of canine hepatitis can produce an inapparent infection in baboons, *Papio papio*, exposed to contact infection. Complement-fixing antibodies for the virus were demonstrable in the sera of 17 baboons housed on premises where infected dogs were handled.

III. Complement-fixing antibodies which reacted with canine virus hepatitis antigen were demonstrable in the serum of 22·3% of 1,160 adult people and in that of 2 out of 14 children examined. The role of man in the dissemination of the virus among the dog population needs to be investigated.—W. Mansi.

Ertürk, O. (1956). **A comparison of the effectiveness of certain antibiotics on *Miyagawanella felis* virus in chick embryos.**—*Cornell Vet.* **46**, 355-360. [Abst. from author's summary.] **3811**

The virus of feline pneumonitis and one of several antibiotics were inoculated simultaneously into chick embryos. Tetracycline, streptomycin and oxytetracycline were the most effective in inhibiting multiplication of the virus, since more embryos survived with these antibiotics than with carbomycin. Erythromycin was toxic for chick embryos and could not be evaluated.

Lucas, A., Toucas, L., Feugeas, C., Laroche, M. & Monin, L. (1956). Étude d'un virus atténué de la myxomatose du lapin. Le virus "Yonne 1955". [**Study of an attenuated strain of myxoma virus from rabbits.**]—*Rec. Méd. vét.* **132**, 298-305. **3812**

Yonne 1955 virus was obtained from a rabbitry in which animals were affected with the nodular form of myxomatosis. The disease ran a prolonged course, recovery being frequent except among the very young. Study of the virus showed it to be attenuated, and to have a longer period of incubation than the typical virus. The percentage mortality was low, and in one experiment reached only 42%. A feature of the experimental disease was the appearance of a secondary crop of nodules at any time from the 15th day after injection onwards.

—I. W. Jennings.

Innes, J. R. M., McAdams, A. J. & Yevich, P. (1956). **Pulmonary disease in rats. A survey with comments on "chronic murine pneumonia".** — *Amer. J. Path.* **32**, 141-159. **3813**

A description of chronic murine pneumonia which is endemic in the majority of laboratory rat colonies. It may first be found in the unweaned young and the incidence increases with age until few of the adult rats are free. Gross pathological changes may take place in the absence of clinical symptoms in life. The macroscopic and microscopic lesions are described, and the importance of the condition as a complicating factor in experimental work is stressed. Dietary deficiencies and a number of bacteria have been incriminated, but the authors believe the primary agent to be a virus. There are brief descriptions of methods of breeding disease-free colonies of rats.—W. E. Parish.

Loosli, C. G. & Hamre, D. (1956). **Experimental air-borne mouse pneumonitis virus (MPV) infections in mice. IV. A model system for evaluating the effectiveness of**

antibiotics and sulfonamides against the psittacosis agents. — *Proc. 92nd Ann. Meet. Amer. vet. med. Ass.* 1955. 422-432. Discussion: pp. 432-433. [Abst. from authors' summary.] **3814**

Chlortetracycline, oxytetracycline, chloramphenicol, and erythromycin, given orally, were highly effective in the prevention and treatment of air-borne infection with mouse pneumonitis virus. Benzylpenicillin in large amounts also suppressed infection and eradicated virus from the lungs. Sulphadiazine, sulphathiazole, and sulphamerazine were highly effective against sulphadiazine-sensitive strains of the virus. On serial passage in sulphadiazine-treated mice, the virus rapidly became resistant to sulphadiazine and to related sulphonamides. *p*-Aminobenzoic acid neutralized the action of sulphadiazine and related sulphonamides on sulphadiazine-sensitive virus.

HAAS, V. H. & STEWART, S. E. (1956). **Sparing effect of A-methopterin and guanazolo in mice infected with virus of lymphocytic choriomeningitis.**—*Virology.* **2,** 511-516. [Authors' abst. modified.] **3815**

An anti-folic acid metabolite, a-methopterin, and an anti-pyrimidine metabolite, guanazolo, prolonged or spared the lives of certain mice infected with doses of lymphocytic choriomeningitis virus that were uniformly fatal to untreated mice. A-methopterin was more effective than guanazolo, and both were more potent in (C × DBA) F_1 than in Swiss mice, but the infection was not eradicated, and surviving mice had prolonged periods of viraemia. Those tested had developed specific immunity.

NADEL, M. K. & EISENSTARK, A. (1956). **The decrease in Newcastle virus titer subsequent to inoculation in de-embryonated eggs.**—*Poult. Sci.* **35,** 870-871. [Authors' summary modified.] **3816**

Haemugglutination and infectious titres of Newcastle disease virus were determined in de-embryonated eggs at specific intervals after inoculation of the virus. At least 99·99% of viral activity was not recoverable after 60 min. The use of de-embryonated eggs without chorio-allantoic membrane, which contained either Hank's saline soln. or normal allantoic fluids, showed that thermal inactivation at 37°C. played a role in the loss of infectivity, but this was smaller than the loss due to adsorption of the virus on the chorio-allantoic cells.

RAGGI, L. G. & BANKOWSKI, R. A. (1956). **Study of some commercially available infectious bronchitis vaccines. I. Response of chickens to seven infectious bronchitis vaccines.**—*Amer. J. vet. Res.* **17,** 523-530. **3817**

Seven different preparations of attenuated infectious bronchitis virus differed widely in the duration and severity of the reaction of fowls to inoculation; in the extent of protection conferred (in many cases fairly low); and in the spread of the virus from inoculated to susceptible, uninoculated fowls in contact. In general, a more satisfactory immune response was obtained in fowls aged 4 weeks or more than in chicks aged 1–4 days.—R.M.

JUNGHERR, E., SUMNER, F. & LUGINBUHL, R. E. (1956). **Pathology of egg-adapted avian encephalomyelitis.** — *Science.* **124,** 80-81. **3818**

Avian encephalomyelitis virus has been adapted to chick embryos by intraocular inoculation at 11 days, as demonstrated by serial passage, reproduction of the disease in chicks with egg-propagated virus, neutralization of the virus in eggs and chicks by immune serum, and by recognition of a specific tissue reaction in the embryos. This latter consisted essentially of encephalomalacia and muscular dystrophy.

—L. M. MARKSON.

KISSLING, R. E., SCHAEFFER, M., FLETCHER, O. K., STAMM, D. D., BUCCA, M. A. & SIGEL, M. M. (1956). **Diagnosis of psittacosis in parakeets.** — *Publ. Hlth. Rep., Wash.* **71,** 719-724. **3819**

Of 117 budgerigars which were positive either to the direct or the indirect c.f. test, 47 harboured psittacosis virus in the liver and spleen as revealed by mouse inoculation tests. Eight of 55 birds from which virus was recovered were negative to the c.f. test. Of 23 birds whose organs yielded virus, only 13 shed virus in their droppings. The c.f. test is recommended for the diagnosis of psittacosis in flocks.

—M.G.G.

ROGER, F. & ROGER, A. (1956). Immunisation expérimentale contre *Rickettsia burneti* par un vaccin tué. **[Experimental immunization against *R. burneti* by a killed vaccine.]**—*C. R. Acad. Sci., Paris.* **242,** 2889-2891. **3820**

Intradermal inoculation of a formolized suspension of *R. burneti* produced a rapid immunological response in rabbits. The authors discussed the use of this method in large animals.

—R.M.

WEISS, E. & PIETRYK, H. C. (1956). **Growth of *Coxiella burnetii* in monolayer cultures of**

chick embryo entodermal cells.—*J. Bact.* **72,** 235-241. [Authors' summary modified.] **3821**

Monolayer cultures of entodermal cells derived from the avascular membrane of 4-day-old chick embryos were used for study of the growth of *Rickettsia burneti* and for the development of a quantitative method of assay. The organisms were readily recognized in stained cultures from the 4th day after inoculation, developed in the cytoplasm of their host cells, slowly invaded neighbournig cells, and, provided the concentration of the inoculum was small, formed discrete foci of infection from the 5th–10th days. Counts of the foci of infection yielded consistent results and a titre for the inoculum which corresponded to the tissue culture ID_{50}. It was intermediate between the chick embryo LD_{50} and ID_{50}. Recent explantation of the cells, a high host-nutrient ratio, and the presence of host cell constituents, all tended to enhance infection. The focus count method of quantitation appeared to be well suited for a study of factors favouring adsorption of rickettsia on to host cells and their subsequent growth.

See also absts. **3868** (papillomatosis); **3997** (report, National Institute of Research in Dairying); **3998** (report, Northern Rhodesia); **3999** (report, Mauritius).

IMMUNITY

ROWLEY, D. (1956). **Rapidly induced changes in the level of non-specific immunity in laboratory animals.**—*Brit. J. exp. Path.* **37,** 223-234. [Abst. from survey of paper (p. i).] **3822**

Injection of Gram-negative bacterial cell walls into laboratory animals caused rapid changes in susceptibility to infection with *Bact. coli*+mucin. During the first hour the animals were much more susceptible, but after 24 hours resistance developed. The active material in the walls was in the lipopolysaccharide fraction. It is suggested that changes in bactericidal power of the serum were the cause of the changes in immunity. A smooth virulent strain of *Bact. coli.* contained more active material than a smooth avirulent strain of the same antigenic type. Rough strains were more sensitive to the killing action of serum than were the smooth parent strains. The possible relationship between these effects on immunity and concurrent changes in the levels of serum properdin was discussed.

SIMONSEN, M. (1956). **Actively acquired tolerance to heterologous antigens. Immunological consequences of transfusing chicken embryos with human blood.** — *Acta path. microbiol. scand.* **39,** 21-34. [In English. Abst. from author's summary.] **3823**

Human whole blood is very toxic for the chick embryo 10–11 days old but considerably less so when the embryo is one week older. The toxicity is virtually restricted to the plasma and can be reduced by heating to 56° for 30 min. or by absorption with fowl erythrocytes. Various preparations of human blood cells were injected i/v into embryos 10–19 days old and into 3-day-old chicks. They were challenged when 5 weeks old with 2 i/m injections of washed blood cells from the original donors. Antibody formation was depressed in chicks which had been treated on or after the 15th day of embryonic development. The 17th–19th days were the most susceptible phase for induction of immunological tolerance. The partial immunological tolerance conferred on embryos 18 days old vanished during the second month after hatching, but could to some extent be maintained by 0·1 ml. of human whole blood injected i/v once weekly, beginning at 3 days after hatching. The concept of embryonic adaptation to antigens is discussed.

BILLINGHAM, R. E., BRENT, L. & MEDAWAR, P. B. (1956). **[The antigenic stimulus in transplantation immunity.** — *Nature, Lond.* **178,** 514-519. [Authors' summary copied *verbatim.*] **3824**

Cells totally disintegrated by ultrasonic irradiation retain their power to elicit skin transplantation immunity in mice. The substances responsible for this property reside wholly in the nuclei of cells, and are developed well before birth. They are inactivated by lyophilization, by freezing and thawing, and by heating to 48·5°C. They are inactivated by digestion with desoxyribonuclease but not with ribonuclease or, in certain stated circumstances, with trypsin. They are insoluble in salt solutions of physiological strength, but are soluble in water, from which they may be precipitated in an active form by the addition of calcium chloride; and they are extracted from nuclei by treatment with 2*M* sodium chloride solution. These facts,

together with cognate evidence from other sources, make it probable that the antigens responsible for skin transplantation immunity are desoxyribonuceleoproteins.

I. Brambell, F. W. R. & Halliday, R. (1956). **The route by which passive immunity is transmitted from mother to foetus in the rat.**—*Proc. roy. Soc.* Ser. B. **145,** 170-178. **3825**

II. Halliday, R. (1956). **The termination of the capacity of young rats to absorb antibody from the milk.**—*Ibid.* 179-185. **3826**

III. Hemmings, W. A. (1956). **Protein selection in the yolk-sac splanchnopleur of the rabbit: the distribution of isotope following injection of ^{131}I-labelled serum globulin into the uterine cavity.**—*Ibid.* 186-195. [Authors' summaries slightly modified.] **3827**

I. The route by which maternal gammaglobulin reaches the circulation of 19- and 20-day-old foetal rats was investigated by surgical experiments on the foetuses *in situ* and by the use of antibodies such as marked globulin. Antibodies from immune rats serum injected into the uterine lumen entered the exocoelomic and amniotic fluids of the foetus by way of the yolk-sac splanchnopleur and amnion. Antibodies from immune rat serum administered by mouth to the foetus were absorbed in the gut and appeared in the circulation. Antibodies were also absorbed by, and entered into the circulation of, the inverted yolk-sac splanchnopleur from immune rat serum to which it was exposed. They still reached the foetal circulation when entry by both these routes was precluded by keeping the mouth closed and removing the yolk-sac splanchnopleur. In these circumstances antibodies were probably absorbed from the cavities in the entodermal sinus of Duval and must have been transported by the allantoic circulation, but the possibility of passage from the maternal circulation directly across the placenta could not be excluded.

II. Young rats cease to absorb antibodies from milk or immune serum in the gut at 20 days of age. Yet antibodies continue to be secreted in the milk of immune mother rats after the young have reached this age. The cessation of absorption by the young is comparatively sudden and shows little age variation. The possibility that it is brought about by extrinsic factors in the food was investigated. It was found that young rats fostered on the mothers of litters older than themselves continued to absorb antibodies beyond the age at which the foster-mother's own young would have ceased to do so. Conversely, young rats fostered on the mothers of litters younger than themselves ceased to absorb antibodies at the normal age, although the foster mothers' own young would have continued to do so. Young rats prevented from taking solid food and compelled to live entirely on milk beyond the normal age nevertheless ceased to absorb antibodies at 20 days of age. Conversely, young rats fed on solid food before the normal age continued to absorb antibodies until 20 days of age. Hence it does not appear that the food is responsible for bringing about the change in the permeability to the gut of the young rats to antibodies. Unweaned rats given a single inj. of *S. pullorum* at from 10 to 33 days of age produced comparatively high titres of circulating antibody after 8 or 10 days.

III. Following injection into the uterine cavity of pregnant rabbits, rabbit agglutinins and rabbit and bovine iodoglobulin were present in the serum of the foetuses. The concentrations of rabbit agglutinin and rabbit iodoglobulin in the foetal circulation, relative to those injected, were lower than when natural antitoxin was used. The relative conc. of rabbit to bovine iodoglobulin in the foetal circulation was not greatly different from that of rabbit to bovine antitoxin using natural serum.

Injections were made into one horn of the uterus; high concentrations of isotope were discovered in the non-protein fraction of serum of foetuses in the untreated horn. The total isotope content of foetuses in the injected horn was always greater than that of those in the untreated horn: this was probably due to direct uptake from the uterine lumen. It is in part accounted for as circulating iodoglobulin; the remainder, amounting to approx. one-twentieth of the dose injected, was of equal magnitude whether bovine or rabbit protein was injected.

Berglund, K. (1956). **Studies on factors which condition the effect of cortisone on antibody production. III. The significance of time of hormone administration in primary agglutinin response to *S. typhi* H.**—*Acta path. microbiol. scand.* **38,** 403-415. [In English.] **3828**

White male rats weighing approx. 200 g. were given a single i/p injection of *S. typhi* H vaccine. The effect on the subsequent level of circulating agglutinins was examined when the administration of cortisone was varied in duration and time relative to the injection of the antigen. I/m injection of cortisone acetate at the rate of 4 mg./100 g. body wt. for 6 days before or for 9 days after the antigen injection significantly lowered the subsequent agglutinin

level. Treatment for 4 days preceding the antigen injection was only effective in lowering the antibody level when the injections were continued for a further 6 or more days. Cortisone given at a lower rate (2 mg./100 g. body wt.) for 14 days after the antigen injection was ineffective. These results are discussed in conjunction with those obtained by the injection of cortisone into rats immunized with sheep erythrocytes.—A. E. Pierce.

Saint-Paul, M., Millot, P. & Eyquem, A. (1956). Contribution à l'étude des antigènes leucocytaires et thrombocytaires de l'homme et des animaux. [**Leucocytic and thrombocytic antigens in man and animals.**]—*Ann. Inst. Pasteur.* **90,** 402-418. [English summary.] **3829**

A comparative study was made of the serum titres of rabbits, cattle and horses immunized with the erythrocytes of man and of sera from rabbits immunized with the white cells of man, and the blood platelets of man, sheep, ox and pig. Cross absorption of immune rabbit sera with the blood platlets of the ox, sheep, goat, pig and horse revealed 5 antigenic components arbitrarily designated A, B, C, D and P. A was common to the blood platelets of the ox, sheep, pig, dog and horse, C to the sheep, goat and horse, and D to the pig, horse, sheep and goat. B was restricted to the ox, and P to the pig. The C and P components were present on human platelets.—A. E. Pierce.

Neimann-Sørensen, A. (1956). **Investigations on the B-blood group alleles in 3 Danish breeds of cattle.** — *K. VetHøjsk. Aarsskr.* 1956. pp. 49-63. [In English. Abst. from author's summary.] **3830**

The present state of knowledge of the bovine blood group systems is given, with a more detailed description of the B system. The methods of establishing the B-alleles in the R.D.M. (Red Danish Dairy Cattle), S.D.M. (Black and White Danish Dairy Cattle), and Jersey breeds are described and a complete list is given of the alleles. There are 24 different B-alleles in R.D.M., 21 in S.D.M. and 15 in Jersey. The results are given of blood tests on 864 R.D.M., 117 S.D.M. and 54 Jersey bulls. The gene frequencies are calculated according to an iterative method of allocation of phenotypes on the basis of the Hardy-Weinberg law. The usefulness (*i.e.* the probability that 2 individuals chosen at random are of the same blood group) of the B-system for the R.D.M., S.D.M. and Jersey breeds are calculated to be 11·6%, 6% and 3·6% respectively. The results are discussed in relation to studies in the U.S.A. and the history of the breeds. Of 18 new alleles found, 16 were in the R.D.M. or S.D.M. breeds. About 83% of Jersey cattle have at least one breed-characteristic B-allele, as against 57% for R.D.M. and 58% for S.D.M.

Eyquem, A. & Podliachouk, L. (1956). Présence des antigènes J, R et A dans le sérum de l'homme et des mammifères. [**Presence of antigens J, R and A in the serum of man and animals.**]—*Ann. Inst. Pasteur.* **90,** 419-426. [English summary.] **3831**

A difference in the distribution of J positive cattle was associated with two essentially different breeds. However, those cattle which were J negative showed a similar frequency of anti-J haemolysin. Of 200 cattle 33% had J positive erythrocytes and plasma, 25·5% had J positive plasma and 41·5% were J negative. Sera from various mammals were examined for inhibitors of bovine anti-J haemolysin, and sheep anti-R and human anti-A agglutinins. The following groups were distinguished: horse, mule and g. pig which had no homologous inhibitors for these antibodies, certain cattle which possessed the anti-J inhibitor, certain sheep, goats and dogs which possessed the anti-J and anti-R inhibitors, and human beings (group A) and chimpanzees together with certain Cyanocephalus monkeys which possessed inhibitors for all three antibodies.—A. E. Pierce.

McDuffie, F. C. & Kabat, E. A. (1956). **The behavior in the Coombs test of anti-A and anti-B produced by immunization with various blood group A and B substances and by heterospecific pregnancy.** — *J. Immunol.* **77,** 61-71. [Abst. from authors' summary.] **3832**

It was found that no proper distinction could be made between such antibodies on the basis of their being "natural" or immune.

Anderson, J. R. (1956). **The experimental production of erythroblastosis foetalis in rabbits.** — *Brit. J. Haematol.* **2,** 44-60. [Author's summary modified.] **3833**

Erythroblastosis foetalis was observed in the incompatible young resulting from the matings of iso-immunized doe rabbits with bucks of the same blood-group as that of the blood used to immunize the does. The disease resembled human erythroblastosis foetalis in affecting the foetus *in utero,* in causing a high

intra-uterine and neonatal mortality, haemolytic anaemia, hydrops foetalis and hepatic necrosis. The affected rabbits never became jaundiced. Congestive changes observed in the liver, speen and lungs may have been caused by intravascular agglutination.

See also absts. **3666** (serological typing of haemolytic streptococci); **3674** (relationship of two anthrax-toxin components to immunizing aggressins); **3680** (TB.); **3690** (evaluation of mallein by haemagglutination); **3694** (serological diagnosis of listeriosis); **3713-3720** (brucellosis); **3740-3746** (infections with PPLO); **3763** (toxoplasmosis); **3768-3770** (F. & M. disease); **3773-3775** (rabies); **3776-3778** (fowl pox); **3780** (cross immunity in Japanese B. and St. Louis encephalitis); **3781** (Coombs test in E.I.A.); **3784-3787** (rinder-pest); **3792** (ovine virus abortion); **3796-3804** (swine fever); **3806-3807** (distemper); **3808-3810** (canine virus hepatitis); **3816** (Newcastle disease); **3817** (avian infectious bronchitis); **3818** (avian encephalomyelitis); **3820-3821** (Q fever); **3868** (papillomatosis).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

GAILIUNAS, P. (1956). **Observations on the possible relationship between the movement of cattle and the occurrence of the warble season.**—*J. Amer. vet. med. Ass.* **129,** 167-169. [Author's summary modified.] **3834**

The early seasonal appearance of warbles in the backs of four lots of cattle, presumably moved from southern to northern states, is reported. In two lots *Hypoderma lineatum* larvae were also found in the oesophagus, possibly the result of two egg-laying periods.

RAUN, E. S. & CASEY, D. J. (1956). **A comparison of back rubber formulations for controlling horn and stable flies in Iowa.**—*J. econ. Ent.* **49,** 395-397. **3835**

Cables hung between posts or trees were wrapped in sacking treated with butoxy polypropylene glycol plus D.D.T. or methoxychlor; D.D.T.; or methoxychlor. The devices controlled *Siphona* (*Lyperosia*) *irritans* but not *Stomoxys calcitrans* on cattle.—M.G.G.

GOODWIN, W. J. (1956). **Control of horn flies on cattle with treated rubbing devices.** — *J. econ. Ent.* **49,** 407-408. **3836**

Siphona (*Lyperosia*) *irritans* was controlled by allowing cattle to rub themselves against cables wrapped in sacking and tautly secured to posts near salt licks and water. The sacking was treated with butoxy polypropylene glycol plus D.D.T. or methoxychlor; or malathion; perthane; D.D.T.; or methoxychlor.—M.G.G.

DEFOLIART, G. R. (1956). **Dusting for horn fly control on beef herds.**—*J. econ. Ent.* **49,** 393. **3837**

A fast and economical method of controlling *Siphona* (*Lyperosia*) *irritans* is to apply D.D.T. to the backs of cattle with a hand-operated rotary duster. 50% D.D.T. wettable powder, applied at the rate of 19–26 g. per animal, controlled the fly for 3 weeks.—M.G.G.

DEFOLIART, G. E. (1956). **Fly control in Wyoming barns.**—*J. econ. Ent.* **49,** 341-344. **3838**

Of various insecticides applied as residual sprays, 1% diazinon gave the best results, controlling flies in dairy byres for up to 11 weeks.

—M.G.G.

KEIDING, J. (1956). **Resistance to organic phosphorus insecticides of the housefly.**—*Science.* **123,** 1173-1174. **3839**

High resistance of *Musca domestica* to organic thionophosphates is reported on Danish farms where these insecticides have been used for a number of years.—M.G.G.

STUNKARD, H. W. & LANDERS, E. J. (1956). **A *Cuterebra* larva (Diptera) from the epidural space of a cat.**—*J. Parasit.* **42,** 432-434. **3840**

A first-stage *Cuterebra* larva was found in the epidural space on the left side of the brain of a cat, in the anterodorsal portion of the cerebral fossa. The possible mode of entry was discussed.—M.G.G.

LEWIS, D. J. (1956). **Biting times of parous and nulliparous *Simulium damnosum*.** — *Nature, Lond.* **178,** 98-99. **3841**

Dissections of *S. damnosum* caught in the Republic of the Sudan revealed that a greater number harboured developing *Onchocerca* worms when collected before 1 p.m. than those flies captured later in the day. By dissecting the ovaries and their ducts and examining them in normal saline, it was possible to distinguish between nulliparous and parous flies. Of 179 specimens caught in the mornings during December 60·9% were parous and 12·3% contained developing *Onchocerca*. Of 202 caught in the afternoons 25·2% were parous and 5·9% contained developing *Onchocerca*.

—W. E. PARISH.

ROSE, I. (1956). **Evidence of a neuromuscular block in tick paralysis.**—*Nature, Lond.* **178,** 95-96. **3842**

There was no motor response to electrical stimulation of the fibular (peroneal) nerve of 2 dogs and a lamb, paralysed as a result of infestation with *Dermacentor andersoni*. It was concluded that the paralysis was due to neuromuscular block similar to that caused by curare.—R.M.

GRABER, E. R. (1956). **The intravenous use of trypan blue in the treatment of *Demodex folliculorum* infection in dogs.**—*Mich. St. Univ. Vet.* **16,** 118-119 & 130. **3843**

Sterile trypanblue at a dosage rate of 1 ml. per 5 lb. body weight was used intravenously to treat 5 cases of demodectic mange. Three treatments were usually given at intervals of about 2 weeks. Four cases responded satisfactorily with growth of hair; the fifth showed resolution of the lesions, but hair growth was delayed.—E. J. L. SOULSBY.

See also abst. 4000 (book, parasites and parasitism).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

DORSMAN, W. (1956). **Fluctuation within a day in the liver-fluke egg-count of the rectal contents of cattle.** — *Vet. Rec.* **68,** 571-574. [Abst. from author's summary.] **3844**

The number of eggs of *Fasciola hepatica* per g. of rectal contents, collected hourly from housed and grazing cattle was recorded. A gradual increase during the morning was followed by a gradual decrease in the afternoon after a peak at about 1.30 p.m. At night the count remained constant at the minimum value of 5 eggs per gramme.

URQUHART, G. M. (1956). **The pathology of experimental fascioliasis in the rabbit.** — *J. Path. Bact.* **71,** 301-310. [Author's summary modified.] **3845**

From an examination of the liver of rabbits experimentally infected with *Fasciola hepatica* it is suggested that the cirrhosis was due to healing of the migration tracts and infarcts, chronic cholangitis caused by adult flukes in the large bile ducts, hyperplasia of both connective tissue and biliary elements in the portal tracts, and granulomatous lesions caused by fluke eggs. Obstruction of the biliary tract did not appear to play a part.

SINHA, P. K. & SRIVASTAVA, H. D. (1956). **Studies on *Schistosoma incognitum* Chandler, 1926. I. On the synonym and morphology of the blood-fluke.** — *Parasitology.* **46,** 91-100. **3846**

A detailed illustrated account of the morphology of both sexes of *S. incognitum* from the liver of pigs in India. The fluke can infest other species of animals, including ruminants and dogs. There are 18 references.—D. W. JOLLY.

JOVE, J. A. (1956). **Use of molluscicides in the control of bilharziasis in Venezuela. Equipment and methods of application.**—*Bull. World Hlth Org.* **14,** 617-638. [French summary. Author's synopsis slightly modified.] **3847**

The application of molluscicides to the breeding-places of *Australorbis glabratus*—the intermediate host of *Schistosoma mansoni* in Venezuela—is discussed, with special reference to the equipment and the techniques. The characteristics of the three molluscicides in use—copper sulphate, sodium pentachlorophenate, and copper pentachlorophenate—are outlined, and the treatment both of running waters (irrigation canals and streams) and of still waters (ponds and marshes) is described in detail.

KLOCK, J. W. (1956. **An automatic molluscicide dispenser for use in flowing water.** — *Bull. World Hlth Org.* **14,** 639-646. [French summary. Abst. from author's synopsis.] **3848**

This dispenser consists basically of a measuring weir coupled to a siphon operated by a float, and was designed for simplicity, low cost, construction with commonly available materials, and operation by untrained personnel. It is more accurate and more effective than the staff which it replaces.

CAMPBELL, W. C., TODD, A. C., COX, D. D. & KROHN, A. F. (1956). **Monieziosis in a Wisconsin lamb.**—*J. Amer. vet. med. Ass.* **129,** 74-75. **3849**

A description of a lamb reported to have died from an infestation of 251 specimens of *Moniezia expansa* despite two attempts at treatment the previous month.—W. E. PARISH.

ABDOU, A. H. (1956). **The use of di-*n*-butyl tin dilaurate for treatment of chickens experimentally infected with *Davainea proglottina*.** —*J. Helminth.* **30,** 121-128. **3850**

The tin compound given *per os* in a capsule, at the dosage rate of 0·5 ml. per kg., effectively removed all tapeworms (*D. proglottina*) from fowls each infected with 500 cysticercoids. At lower dosages it was ineffective. The maximum safe dose was estimated to be 1·0 ml. per kg. Anthelmintic efficiency was assessed by examination of faeces, and by P.M. examination.

—D. W. JOLLY.

HILL, C. H. (1956). ***Trichinella spiralis* from the urinary bladder of a pig.**—*J. Parasit.* **42,** 434. **3851**

A gravid female *T. spiralis* was recovered

from the lumen of the urinary bladder of an experimentally infested boar. No larvae were found in organs and tissues not containing striated muscle.—M.G.G.

TRAWINSKI, A. (1956). La lutte contre la trichinose. **[Control of trichinosis.]** — *Bull. Off. int. Epiz.* **46**, May. pp. 273-282. [English summary.] **3852**

The various aspects of trichinosis with reference to the hosts, the methods of infestation, the life cycle, the resistance of encysted larvae, and diagnosis, are discussed. It is considered that control methods should be directed towards the prevention of infestation among pigs and edible game; and, the marketing of meat known to be free from larvae.

—T.E.G.R.

HERLICH, H., DOUVRES, F. W. & ISENSTEIN, R. S. (1956). **Experimental infections of guinea pigs with *Trichostrongylus colubriformis*, a parasite of ruminants.**—*Proc. helm. Soc. Wash.* **23**, 104-105. [Abst. from authors' summary.] **3853**

G. pigs were successfully infected with *T. colubriformis* by the administration of infective larvae.

THOMAS, R. J. & STEVENS, A. J. (1956). **Some observations on Nematodirus disease in Northumberland and Durham.**—*Vet. Rec.* **68**, 471-475. **3854**

The first part of this paper comprises a description of *Nematodirus* disease as seen in Northumberland during the years 1951–55. The disease occurs chiefly during June, but early cases are seen at the end of May and late ones in early July. Adult sheep are never affected, the disease being confined to lambs 6–12 weeks old. The disease is characterized by its sudden onset, a high proportion of the lamb flock showing a profuse diarrhoea, and deaths occur from 2 days to 2 weeks after the beginning of an outbreak. P.M. examination reveals dehydration of the carcass and a catarrhal enteritis. The number of *Nematodirus* spp. present varies from 10 to 200 thousand, the average being about 40,000. Observation shows that the disease always occurred on pasture which had carried sheep the previous year, and never on new ley except where lambs running on new ley had been moved there from old pasture.

An experimental study was made of the survival of the free living stages of *Nematodirus* spp. on pasture. A 30 acre permanent pasture was grazed by a flock of 20 ewes and 40 lambs during May and June 1954, during which time the lambs were voiding as many as 1,250 *Nematodirus* eggs per gram. Ewes also grazed the pasture in Sept.–Oct. and December but no *Nematodirus* eggs could be detected in their faeces at this time. Examination of pasture herbage samples showed that only small numbers of larvae were found on the pastures until the beginning of May 1955, when a spectacular rise occurred. A peak was reached on May 10th upon which the count fell again and it remained at a low level until observations ceased in October 1955. This work demonstrates that the larval stages of *Nematodirus* can survive on pasture for at least 11 months. Since this peak of larval infestation of pasture occurs in early May the disease can be avoided by ensuring that susceptible lambs do not graze during late April to mid June, pasture which has carried sheep during the previous 12 months.—T. E. GIBSON.

GRABER, M. (1956). Action d'un nouvel anthelminthique: le dithiocarbamate de pipérazine sur les nématodes du mouton. Premières observations. **[Piperazine dithiocarbamate as an anthelmintic for sheep.]**—*Rev. Élev.* **9**, 141-147. [English and Spanish summaries.] **3855**

Piperazine dithiocarbamate, given orally in a dose of 125 mg./kg. body wt., eliminated *Oesophagostomum columbianum* from sheep, but was only partially effective against *Haemonchus contortus*. The drug was well tolerated by the sheep.—M.G.G.

MARQUARDT, W. C. & FRITTS, D. H. (1956). **A test of two piperazine compounds against nematodes of sheep.** — *J. Amer. vet. med. Ass.* **129**, 153-155. [Authors' summary modified.] **3856**

Piperazine hexahydrate and glycopiparsol (piperazine glycolylarsanilate) were ineffective against *Trichostrongylus*, *Nematodirus*, *Strongyloides*, and *Trichuris* in sheep. Glycopiparsol is too toxic to be considered for further testing as an anthelmintic in sheep.

HERLICH, H. (1956). **A digestion method for post-mortem recovery of nematodes from ruminants.**—*Proc. helm. Soc. Wash.* **23**, 102-103. [Author's summary modified.] **3857**

A procedure using the hydrochloric acid-pepsin digestion technique is described for the recovery of nematodes from in the tissues of the gastro-intestinal tract of ruminants. It led to the recovery of many nematodes which otherwise would not have been found.

DUNN, D. R. (1956). **Studies on the pig lungworm (*Metastrongylus* spp.) II. Experimental infection of pigs with *M. apri*.—*Brit. vet. J.* 112,** 327-337. [Author's summary modified.] **3858**

M. apri infestation was produced in 8 pigs by feeding infected earthworms (*Eisenia foetida*). Eggs were demonstrated in the faeces by magnesium sulphate flotation and first appeared 3–4 weeks after dosing. Egg counts rose rapidly and then fell to a low and fairly constant level. The only symptom was coughing, and there was no interference with growth and weight gain, except in one pig. Blood eosinophiles usually rose two weeks after dosing to 10–15% and then fell to 2–6% if no further doses were given. The lung lesions comprised a verminous pneumonia with giant cells, associated with the recent development of the parasites to the egg-laying stage and the liberation of large numbers of eggs into the lung parenchyma, and later the more chronic lesions of bronchitis, emphysema, peribronchial lymphoid hyperplasia and bronchiolar muscular hypertrophy in animals that were not killed until at least 9 weeks after dosing. Greyish nodules up to 8 mm. in diameter, formed from peribronchial lymphoid hyperplasia and situated mainly along the inferior border of the diaphragmatic lobe and at its caudal end, were the characteristic gross lesions in adult pigs. These lesions are identical with those found in naturally infected pigs.

FRICSAY, M. (1956). Lungenveränderungen bei Laboratoriumsratten infolge Infektion mit *Trichosomoides crassicauda*. **[Lung lesions in laboratory rats resulting from infection with *Trichosomoides crassicauda*.]**—*Schweiz. Z. allg. Path.* **19,** 351-355. **3859**

F. attributed granulomatous inflammatory changes in the lungs of rats to invasion by larvae of *T. crassicauda*, a nematode parasite of the urinary bladder.—R.M.

RIEDEL, B. B. & LARSON, E. J. (1956). **The critical evaluation of a new swine anthelmintic containing piperazine and carbon disulfide —Parvex.** — *J. Amer. vet. med. Ass.* **129,** 156-159. **3860**

Four pigs treated with 110 mg./kg. body wt. of pure betaine of 1-piperazine carbodithioic acid mixed with part of the food, expelled 95–100% of *Ascaris suis* within 24 hours of treatment. Within 4 days ova were absent from faeces. Three pigs infected with *Oesophagostomum dentatum* did not expel the worms after treatment nor were there any found P.M., but egg counts were reduced during life. A dose of 125 mg./kg. body wt. given to 6 pigs infected with *A. suis* was said to have been 100% effective. Data were also given of treatment with 125 mg./kg. body wt. of the drug in a carbon disulphide vehicle, the results of which were equally satisfactory. No untoward effects were observed either during life or P.M., and medicated food was readily eaten by the pigs.—E.G.

HAWKING, F. (1956). **The periodicity of microfilariae. IV. Stimuli affecting the migration of the microfilariae of *Dirofilaria aethiops, D. immitis, D. repens, Dipetalonema blanci* and *Litomosoides carinii*.** — *Trans. R. Soc. trop. Med. Hyg.* **50,** 397-417. [Author's summary modified.] **3861**

The stimuli were studied that cause the microfilariae of *Dirofilaria aethiops* in monkeys, *D. immitis* and *D. repens* in dogs, *Dipetalonema blanci* in gerbils, and *Litomosoides carinii* in cotton-rats to enter or leave the peripheral blood. With *D. aethiops*, a rise in the count is caused by increased or decreased oxygen and by anaesthetics (day or night); a moderate rise during the day is caused by increased carbon dioxide or by infusion of ammonium chloride, a fall in the count at night is caused by hyperventilation, by exercise and by infusion of ammonium chloride or sodium bicarbonate. With *D. immitis* and *D. repens*, a rise in the count is caused by increased or decreased oxygen and by anaesthetics (day or night), and a fall is caused by hyperventilation (*D. immitis*, at night). With *Dip. blanci*, a rise in the count is caused by increased oxygen or by anaesthetics; but with *L. carinii* these stimuli have no effect or cause a fall, respectively.

NOBEL, T. A. & OLAFSON, P. (1956). **Spinal nematodiasis in sheep. First report in Israel.** —*Refuah vet.* **13,** No. 1. In Hebrew pp. 1-3. In English p. 52. [Authors' English summary modified.] **3862**

An account of spinal nematodiasis in a sheep, with symptoms and lesions resembling cerebrospinal nematodiasis (setariasis) and neurofilariasis.

See also abstr. **3766** (differentiation between Miescher's tubes and Trichinella); **3866** (oesophageal sarcoma in dogs associated with Spirocerca lupi); **4000** (book, parasites and parasitism).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

LAPOLLA, L. & PIERGROSSI, A. (1956). Su di un caso di sarcoma osteogenico del femore in un cane. **[Osteogenic sarcoma of the femur in a dog.]**—*Acta med. vet., Naples.* **11,** 175-198. [English, French and German summaries.] **3863**

The clinical, radiological and histological manifestations of an osteogenic sarcoma of the femur of a dog are described—the relationship between trauma and tumour formation is briefly discussed. The value of radiology in differential diagnosis and the treatment of this type of tumour are also discussed. A combination of surgical intervention and X-ray therapy is considered satisfactory.—T.E.G.R.

BANKS, W. C. & BRIDGES, C. H. (1956). **Multiple cartilaginous exostoses in a dog.** — *J. Amer. vet. med. Ass.* **129,** 131-135. [Authors' summary modified.] **3864**

The radiographic appearance and the gross and microscopic pathology of skeletal lesions in a dog with multiple cartilaginous exostoses and supervening chondrosarcoma are described. The lesions are discussed in relation to the multiple cartilaginous exostoses which have a hereditary background in man. Lack of information precluded an interpretation of the role of heredity in this case

KÖHLER, H. (1956). Zum sogenannten Mastozytom beim Hund. **[Mastocytoma in dogs.]** — *Schweiz. Z. allg. Path.* **19,** 249-258. [English summary.] **3865**

An account of 26 cases.—R.M.

JARRETT, W. F. H. & URQUHART, G. M. (1956). **Oesophageal sarcomata associated with *Spirocerca lupi* infection in the dog.**—*Trans. R. Soc. trop. Med. Hyg.* **50,** 306. **3866**

In two cases of *S. lupi* infection there were three main pathological features. First, a chronic inflammatory reaction to adult worms involving the wall of the oesophagus and the mediastinal connective tissue, the resulting fibrotic nodules surrounding the aorta at the base of the heart. Secondly, multiple small foreign body granulomata stimulated by the presence of the nematode eggs in the mediastinal tissues. Finally, neoplasms were present in the wall of the oesophagus. In one case there was an anaplastic fibro-sarcoma of great cellularity showing a high mitotic rate; in the other a well-developed osteogenic sarcoma with typical stromal and giant cells and formation of osteoid tissue and bone. [See also *V.B.* **25,** 2908.]. —E.V.L.

DI MARTINO, M. & MASTRONARDI, M. (1956). Sulla ossificazione eterotopica (a proposito di una rara localizzazione alla tiroide). **[Ossification of the thyroid gland in a dog.]**—*Acta med. vet., Naples.* **11,** 199-218. [English, French and German summaries.] **3867**

Ossification of the thyroid gland occurred in a bitch a few months after surgical removal of a bronchial cyst from the subhyoid region. The osseous growth reached the size of a large tangerine and contained a blood-stained serous fluid and small, bony formations of a hard stony consistency, varying in shape and size and enveloped in a thin fibrous capsule. The possible causation is discussed. It is considered that local circulatory disturbances following surgical intervention gave rise to haematomas which underwent biochemical and tissue changes leading to ossification.—T.E.G.R.

STILINOVIĆ, Z. (1955). Liječenje papilomatoze vakcinacijom. **[Vaccine treatment of papillomatosis in domestic animals.]**—*Vet. Arhiv.* **25,** 332-340. [In Croat. English and German summaries.] **3868**

S. described treatment of papillomatosis in 40 cattle, 8 horses and 2 dogs, by 3–4 s/c inj. of increasing doses of formolized tissue vaccines prepared from either homologous or heterologous material or by formolized autovaccines, administered at intervals of 8 days. Doses for cattle were 20, 25 and 30 ml., for horses 10, 15 and 20 ml., and for dogs 5, 10 and 15 ml. Mammary papillomatosis in cattle responded best to a mixture of heterologous and autovaccine. Horses with papillomatosis of the muzzle were cured by either of the vaccines, but infection of other parts of the body appeared to be more resistant to treatment. One dog with advanced oral infection was cured by heterologous vaccine. Surgical removal of papillomata was recommended in addition to vaccine treatment.—E.G.

PALLASKE, G. & CHRISTOPH, H. -J. (1956). Ein weiterer Beitrag zur Leukose des Hundes. **[Leucosis in dogs.]**—*Mh. VetMed.* **11,** 74-78. **3869**

Details were given of the clinical picture, P.M. appearance and histology of leucosis in a dog, the features of which were said to resemble those of bovine leucosis.—E.G.

ARNESEN, K. (1956). **The adrenothymic constitution and susceptibility to leukemia in mice. A study of the AKR/O and WLO strains and their hybrids.** — *Acta path. microbiol. scand.* Suppl. No. 109. pp. 95. [In English. Spanish and Russian summaries.] **3870**

In the inbred AKR/O strain of mice, which shows a high incidence of lymphatic leucaemia and a high susceptibility to transplanted leucaemia, a specific adrenothymic constitution has been described, characterized by a spontaneous, permanent lipid-depletion of the adrenal cortex, and a relative hyperplasia and retarded physiological involution of the thymus. Using the inbred non-leucaemic strain WLO for comparative and hybridization studies, it was shown that a minor part of the thymus hyperplasia is connected with the lipid depletion; this is probably due to a linkage of the recessive adrenocortical lipid depletion gene with part of the polygenic system determining the thymus hyperplasia. The functional significance of the adrenothymic constitution was not determined. There was no proof of any connexion between the lipid depletion of the AKR/O adrenal cortex, and the susceptibility of the strain to spontaneous leucaemia, although an association between these two characters could not be excluded. There were no correlations between the lipid depletion, or the relative thymus hyperplasia, and the susceptibility to transplanted leucaemia.—E. COTCHIN.

CAMPBELL, J. G. (1956). **Leucosis and fowl paralysis compared and contrasted.** — *Vet. Rec.* **68,** 527-528. **3871**

Fowl paralysis tends to affect younger birds than does leucosis, and unlike leucosis, shows a significant seasonal variation in incidence. The leucoses are neoplastic conditions affecting haematopoietic tissue, show the accepted criteria of malignancy, and in at least 2 forms are associated with an "oncogenic virus." Fowl paralysis is typically a chronic disease associated with inflammatory infiltrations in the nerves and viscera, and a progressive, but not neoplastic, accumulation of cells of the lymphoid series which leads to the production of tumour-like lymphogranulomata. Nerve involvement is practically always absent in the leucoses.—E. COTCHIN.

NIGHTALL, E. W. (1956). **A study of the incidence of lymphomatosis in poultry kept at the University of Nottingham School of Agriculture.**—*Poult. Sci.* **35,** 109-125. **3872**

"Lymphomatosis" is used to embrace all tumour conditions which are subgrouped into visceral, neural and ocular lymphomatoses, myelocytoma, and other tumours. The incidence of visceral and neural tumours is outlined in pedigree and cross-bred flocks over a six-year period, and N. emphasizes the significance of breed, strain, and housing. The incidence was lower in birds kept in batteries than in those in either folds or semi-intensive houses.

—F. T. W. JORDAN.

LUCIO BENEDETTI, E., BERNHARD, W. & OBERLING, C. (1956). Présence de corpuscles d'aspect virusal dans des cellules spléniques et médullaires de poussins leucémiques et normaux. [**Presence of virus-like bodies in cells of spleen and bone marrow of normal and leucaemic fowls.**]—*C.R. Acad. Sci., Paris.* **242,** 2891-2894. **3873**

Examination by electron microscopy of ultra-thin sections of spleen and bone marrow from apparently normal fowls and fowls with erythromyeloblastosis revealed the presence of inclusions containing virus-like particles. Their significance is unknown.—R.M.

BIGGS, P. M. (1956). **Lymphoid and haemopoietic tissue.**—*Vet. Rec.* **68,** 525-526. **3874**

In *Gallus domesticus,* apart from the spleen, thymus, bursa of Fabricius and intestinal tract, lymphoid tissue is found as nodules along the course of lymph vessels, and it also occurs in widely separated parts of the body. B. found it, in apparently normal chickens, in trachea, lungs, kidneys, ureters, bone marrow, pancreas, adrenals, gonads, thyroids, pituitary, liver, and connective tissue. Serial sections of 38 adrenals from 6-week-old Rhode Island Red chickens revealed lymphoid tissue in all. It is suggested that the so-called ectopic lymphoid areas may be looked on "as a normal expression of lymphoid tissue which may become hyperplastic or even neoplastic at different stages of lymphoid disease."—E. COTCHIN.

PONTÉN, J. (1956). **Growth and infective virus content of Rous sarcoma cells.**—*Acta path. microbiol. scand.* Suppl. No. 110. pp. 70. [In English.] **3875**

An ascitic variant of the Rous sarcoma was established by intraperitoneal inoculation, and ascitic-tumour cell-growth curves were obtained by quantitative collection of ascitic material at different times after inoculation. The virus activity was estimated by bioassay, inoculating chickens intradermally. The growth process could be divided into (a) an initial period after inoculation, during which the number of tumour

cells decreased, (b) the rapid growth phase, during which the number of tumour cells increased, and (c) a terminal phase, in which the number remained stationary. The cell-associated virus activity appeared to reflect the state of growth of the ascitic tumour cells: a probable decrease of activity occurred in the initial period, and a stationary or decreased activity in the terminal phase, while in the rapid growth phase the activity increased. Extracellular virus activity remained more or less constant.—E. COTCHIN.

NUTRITIONAL AND METABOLIC DISORDERS

BROWNLEE, A. (1956). **The development of rumen papillae in cattle fed on different diets.** —*Brit. vet. J.* **112**, 369-375. [Author's summary modified.] **3876**

In cattle fed kale plus concentrates, followed by mangolds plus concentrates, there was greater development of rumen papillae than in cattle on a diet of hay plus concentrates. New-born and week-old calves fed on milk and bedded with peat-moss did not show development of rumen papillae up to at least 13 weeks of age, whereas 3 groups of week-old calves fed for 12 weeks on milk plus hay, milk plus grass, or milk plus concentrates showed development in increasing degree. In the calves kept on milk alone the rumen was 6 times as heavy as at birth. In calves fed milk and concentrates the rumen mucous membrane was easily torn and areas of superficial erosion of the mucous membrane covering the posterior pillar were observed. Roughage as such is not a factor in developing rumen papillae. It appears that development of the papillae is determined by the energy value of the food or the rapidity with which it is broken down into absorbable fractions. The role played by the animal's behaviour in organ development is discussed briefly.

SWENSON, M. J., GOETSCH, D. D. & UNDERBJERG, G. K. L. (1956). **The effect of the sow's ration on the hematology of the newborn pig.** —*Proc. 92nd Ann. Meet. Amer. vet. med. Ass.* 1955. 159-162. [Authors' summary modified.] **3877**

The blood of piglets aged 36 hours was studied. When the sow had been fed swill during pregnancy, the r.b.c. count of the piglets averaged 3·9 millions per cu. mm.; it averaged 4·8 when the sow had been given a mixture of swill and grain, and 5·1 when the sow had been given a mixed balanced ration. Other differences in the blood of piglets, attributed to feeding swill to the sow during pregnancy, were a larger proportion of nucleated erythrocytes (possibly due to vitamin B_{12} deficiency) and greater mean corpuscular volume. There were no clinical signs of anaemia in the piglets. Diet of the sow had no noticeable effect on the amount of haemoglobin in the blood of piglets. —R.M.

GRIFFIN, C. A. & THOMPSON, W. R. (1956). **Studies of prepared feeds in relation to salmonella infection in laboratory animals. II. Reproduction and growth of mice on heated and unheated commercially prepared feeds.**—*Amer. J. vet. Res.* **17**, 311-317. [For Part I, see *V.B.* **23**, 2777.] **3878**

Salmonella organisms and *Bact. coli* in prepared feeds were killed by exposing bags containing the feeds to 210°–220°F. for 30 min. in a dielectric oven. Heat treatment had no apparent detrimental effect on the nutritive value of the feeds.—R.M.

SCHIPPER, I. A. & EVELETH, D. F. (1956). **Swine enteritis. II. Terramycin levels in sow's milk following intramuscular and oral administration.**—*J. Amer. vet. med. Ass.* **129**. 59-60. **3879**

Eleven nursing sows received i/m one g. of terramycin. Most samples of their milk contained at least 8 μg./ml. of terramycin for the next 12–24 hours. Sows given terramycin orally did not excrete more than about one μg./ml. in the milk.—M.G.G.

CORDY, D. R. & MCGOWAN, B., JR. (1956). **The pathology of massive liver necrosis in sheep.**—*Cornell Vet.* **46**, 422-438. **3880**

Fourteen outbreaks were investigated in the Sacramento Valley. Lambs over 4 months old and ewes that had been at pasture (entirely or predominantly trefoil) for 3–5 weeks were affected. Incidence in affected flocks was 0·1–5% with 90% mortality. Many died suddenly while others lived up to 2 days. Symptoms included depression, anorexia, tachycardia and dyspnoea. Icterus was observed in 50%, photosensitization in 20% and nervous symptoms in about 30%. Serum bilirubin levels were 1·4–4 mg./100 ml. and bilirubinuria was present in several animals tested. The main P.M. finding was a deep yellow to yellowish brown liver with red or reddish brown foci which often coalesced. The hepatic lymph nodes were

enlarged, moist, pale and sometimes yellow. Small haemorrhages were also observed in other organs and tissues. Histologically, the essential liver lesion was necrosis. The aetiology of the condition is unknown, but nutritional deficiency is suggested as a likely cause.—T.E.G.R.

RAICA, N., HEYWANG, B. W. & KEMMERER, A. R. (1956). **Antibiotic concentration in eggs from hens on chlortetracycline supplemented diets.** — *Poult. Sci.* **35,** 884-888. [Authors' summary modified.] **3881**

Laying hens, about a year old, were fed chlortetracycline at the rate of 50, 100, 200, 500, 1,000 and 2,000 g./ton. No antibiotic was detected in the eggs from hens fed at 50–200 g./ton. Amounts varying from 0·018–0·141 μg./g. of egg were found in the eggs of hens receiving 500–2,000 g./ton. The highest percentage of contaminated eggs and the highest concentrations of chlortetracycline were found during the second week of antibiotic supplementation. All eggs were normal within a week after withdrawal of chlortetracycline.

FORTUSHNUI, V. A. (1955). **[Toxicity for animals of potato residues treated with isopropyl phenylcarbamate.]**—*Nauch. Trud. ukrain. Inst. exp. Vet.* **22,** 291-303. [In Russian.] **3882**

Isopropyl phenylcarbamate is used to prevent sprouting of stored potatoes [see Rakitin and Troyan in *Chem. Abstr.* **43,** 7092 (1949)]. Potato residue from distilleries where treated potatoes were used, was not toxic for horses, cattle or pigs. The preservative itself was toxic for lab. animals at a dosage of 3 g. per kg. body wt. or higher.—R.M.

ARMSTRONG, D. G. & BLAXTER, K. L. (1956). **Heat increments of feeding in ruminants.**—*Nature, Lond.* **177,** 1183-1184. **3883**

Calorimetric experiments with fasted sheep revealed that the dissimilation of steam-volatile fatty acids, particularly acetic acid, produced greater heat increment than did glucose given under similar conditions. The association between heat increment in ruminants and fibre content of the food may be due to heat loss during dissimilation of acetic acid, bacause the amount of acetic acid in the fermentation products increases with increasing fibre content.

—R.M.

WISEMAN, R. W., BUSHNELL, O. A. & ROSENBERG, M. M. (1956). **Effect of rations on the pH and microflora in selected regions of the intestinal tract of chickens.**—*Poult. Sci.* **35,** 126-132. **3884**

Carbohydrate fed as either maize meal or molasses did not influence the pH of the intestine, but in all regions examined a higher bacterial population estimated as "aerobes" and lactobacilli was obtained with the former.

—F. T. W. JORDAN.

ANON. (1956). **Glucagon.** — *Brit. med. J.* August 4th. 288-289. **3885**

Glucagon is a polypeptide formed in the pancreas, apparently by the alpha cells, which raises the amount of sugar in the blood when injected i/v. This article reviews recent literature on the actions of glucagon. It plays a part in fat metabolism, but whether it inhibits ketosis or not is undecided.—R.M.

GRAY, F. V. & PILGRIM, A. F. (1956). **Digestion of nitrogenous compounds by ruminants.** —*Nature, Lond.* **178,** 94-95. **3886**

In sheep on a diet of lucerne hay, the proportion of nitrogenous compounds reaching the abomasum was 40% of those ingested. When the diet was wheat hay and lucerne hay, 60% reached the abomasum; with a diet low in protein (wheat hay and straw) 20% more nitrogen passed into the abomasum than was present in the food.—R.M.

PHEAR, E. A. & RUEBNER, B. (1956). **The *in vitro* production of ammonium and amines by intestinal bacteria in relation to nitrogen toxicity as a factor in hepatic coma.**—*Brit. J. exp. Path.* **37,** 253-262. [Abst. from survey of paper (p. i).] **3887**

The authors studied ammonium and amine production *in vitro* by various intestinal bacteria in media containing a mixture of amino-acids. The addition of glucose usually increased growth and reduced formation of ammonium and amine. When chlortetracycline was added in amounts which partially inhibited growth the activity of most, but not all, of the strains was proportionally reduced.

MICHEL, M. (1956). Catabolisme de la choline par la flore intestinale du porc. **[Catabolism of choline by the intestinal flora of pigs.]**—*C. R. Acad. Sci., Paris.* **242,** 2883-2886. **3888**

Choline was broken down by the microflora of the small intestine of the pig. This action was inhibited by certain antibiotics, particularly the tetracyclines, and by some inorganic salts.—R.M.

ARNOLD, R. M. (1956). "La maladie épuisante de Manchester" chez les ruminants de la Jamaique, Antilles britanniques. **["Manchester wasting disease" of cattle in**

Jamaica.]—*Bull. Off. int. Epiz.* **46,** May. pp. 217-231. [English summary.] **3889**

The literature on the condition is reviewed. The disease is characterized by abnormal calcium deposits in various organs and tissues (particularly the cardiovascular system and the lungs), progressive emaciation, and stiffness of the joints. The epidemiology, symptoms, P.M. findings and histological and chemical changes are discussed. The aetiology is unknown, but it seems to be generally accepted that the condition is a nutritional disorder—a mineral deficiency or imbalance.—T.E.G.R.

Spaïs, A. G. (1956). [**Enzootic ataxia of lambs in Greece. Copper deficiency of sheep associated with grazing on salt marshes.**]—pp. 123. Thessaloniki: The University. [In Greek. Abst. from French summary.] **3890**

Endemic ataxia occurs in lambs of flocks grazing salt marsh in the western coastal region of Thessaloniki. The copper content of the blood of affected lambs and their dams was low (mostly less than 30 μg./100 ml.) and so was that of the liver (5–10 μ/g. dry matter). The Cu and molybdenum content of pasture plants was normal, but some contained excessive amounts of sulphates (1–4% dry matter), particularly during a dry summer, when the incidence of ataxia was highest. S. concluded that the disease was due to a conditioned copper deficiency associated with the ingestion of excess sulphates.—R.M.

Pires, A. (1956). Carencia de minerales en los animales bovinos. [**Mineral deficiency disease in ruminants.**]—*Gac. vet., B. Aires.* **18,** 52-89. **3891**

A general discussion, with an extensive bibliography, of mineral deficiency diseases.

—T.E.G.R.

Ford, C. M. (1956). **Nutritional factors and bovine infertility in the East Midlands.**—*Brit. vet. J.* **112,** 177-188. **3892**

Examination of cows in 150 herds of low fertility revealed ovarian dysfunction in 108 herds and infections of the genital tract, mostly *Vibrio fetus* infection, in 53. Determinations were made of calcium and phosphorus in various components of the diet of infertile cows: the amounts varied widely and seemed to depend on the geological type of the soil in which the fodder plants grew. In order to adjust defective Ca/P ratios of some diets, a balanced mineral mixture containing calcium and phosphorus was added, and this led to improved fertility in some cases.

—F. L. M. Dawson.

Brouwer, E. & v. Weerden, E. J. (1956). **Osmotic pressure in the intestine of the cow.**—*Nature, Lond.* **178,** 211. **3893**

The osmotic pressure of the contents of different parts of the digestive tract of 50 cows was measured by the depression of freezing-point method. Abomasum contents were slightly hypotonic when compared with the osmotic pressure of blood; contents of the small intestine were hypertonic at its commencement and isotonic at its termination. The contents of the large intestine, and juice extracted from faeces, were hypotonic. The cow therefore differs from lab. animals, in which an isotonic state prevails. This fact may be of importance in the study of mineral metabolism.—R.M.

Luecke, R. W., Hoefer, J. A., Brammell, W. S. & Thorp, F., Jr. (1956). **Mineral interrelationships in parakeratosis of swine.**—*J. Anim. Sci.* **15,** 347-351 **3894**

A group of pigs fed an experimental diet containing 1·5% calcium, 0·8% phosphorus and 31 p.p.m. zinc, all developed parakeratosis, whereas only one pig developed mild symptoms of the disease in a group fed the same diet supplemented with 20 p.p.m. zinc (as zinc carbonate). A further group of pigs fed a diet with smaller quantities of calcium and phosphorus were only slightly affected and 3 out of 10 developed the skin condition. This was prevented by adding zinc at 20 p.p.m. to the same ration fed to a comparable group.

—W. E. Parish.

Salsbury, R. L., Smith, C. K. & Hüffman, C. F. (1956). **The effect of high levels of cobalt on the *in vitro* digestion of cellulose by rumen micro-organisms.**—*J. Anim. Sci.* **15,** 863-868. [Abst. from authors' summary.] **3895**

The digestion of cellulose *in vitro* by micro-organisms of the rumen was slightly depressed by 12 p.p.m. of cobalt and strongly depressed by 100 p.p.m. Vitamin B_{12} at a concentration of 50 μg. per ml. had no appreciable effect. Feeding high levels of cobalt to a steer eventually depressed the digestion of cellulose by inocula from this animal. The depression was less marked when urea was added to the fermentation.

Gallagher, C. H., Judah, J. D. & Rees, K. R. (1956). **The biochemistry of copper deficiency. I. Enzymological disturbances, blood chemistry and excretion of amino-acids. II. Synthetic processes.**—*Proc. roy. Soc.* Ser. B. **145,** 134-150; 195-205. **3896**

I. Copper deficiency was produced in rats

by feeding copper-free milk supplemented with vitamins. It was characterized by reduced weight, growth, haemoglobin content of the blood, and by loss of black pigment. There was a reduction in cytochrome oxidase activity and succinoxidase activity. Catalase activity was not affected. *Iso*citric dehydrogenase activity was increased. Deficiency had no influence on the amounts of Mg, Ca, K, Na, P or protein in the blood nor on the urinary excretion of amino-acids.

II. Phospholipid synthesis was considerably depressed in copper deficiency. The authors discussed the relationship of this and the other changes mentioned above to demyelination of the central nervous system which occurs in copper deficient sheep, but not rats.—R.M.

MACPHERSON, C. R. (1956). **Myocardial necrosis in the potassium-depleted rat: a reassessment.**—*Brit. J. exp. Path.* **37,** 279-285. [Abst. from survey of paper (p. i).] **3897**

M. described microscopic lesions of the heart in rats on a diet deficient in potassium and containing sodium sulphonic resin. The first changes occurred at the end of the first week and while myocardial necrosis followed, connective tissue and blood vessels were not involved. The differences between this hypokalaemic necrosis and ischaemic lesions were emphasized.

BAUER, G. C. H., CARLSSON, A. & LINDQUIST, B. (1956). **A comparative study of the metabolism of ^{140}Ba and ^{45}Ca in rats.** — *Biochem. J.* **63,** 535-542. [Authors' summary modified.] **3898**

The two isotopes were given i/p to young rats simultaneously. The plasma activity was lower with ^{140}Ba than with ^{45}Ca. In 24 hours 7% of the ^{140}Ba was excreted in the urine and 20% in the faeces, compared with 0·9% and 6% of the ^{45}Ca. The clearance of ^{140}Ba from the plasma through skeletal accretion was about twice that of ^{45}Ca. The clearance from the plasma through reversible exchange reactions was the same for both isotopes. Since there was no fundamental difference in the metabolism of the two isotopes and the half-life of ^{140}Ba is only 12·8 days, this isotope should be suitable as an indicator of skeletal metabolism.

SELYE, H. & BOIS, P. (1956). **On the participation of the adrenal cortex in the production of experimental nephrocalcinosis.**—*Acta endocr., Copenhagen.* **22,** 330-334. [In English.] **3899**

Calcification of the intermediate zone of the kidney was produced in rats within 12 days by giving them 1% sodium phosphate soln. instead of drinking water. It was most severe in adrenalectomized rats injected with desoxycortisone acetate during the period of administration of sodium phosphate, and was absent in similar rats injected with cortisol acetate instead of desoxycortisone.—R.M.

KRETZSCHMAR, C. (1956). Chronische Nephritis und Kalkstoffwechselstörung beim Hund. **[Chronic nephritis and disturbance in the calcium metabolism in dogs.]**—*Tierärztl. Umsch.* **11,** 12-16. **3900**

P.M. findings in 5 dogs included contracted kidneys, hypertrophy of parathyroid glands, generalized fibrous osteodystrophia, and calcium metastases in the pulmonary artery and aorta, myocardium, kidneys and lungs, but not in the stomach and intestines. There was metastatic calcification in the sole pads and near the joints. The paper is illustrated by 12 photomicrographs of lesions.—E.G.

JONES, E. W., ULLREY, D. E. & GALLUP, W. D. (1956). **Liver biopsy for vitamin-A studies in swine.** — *Cornell Vet.* **46,** 360-366. [Authors' summary modified.] **3901**

A technique of liver biopsy in pigs is described. Analysis of samples from various parts of the liver indicated that biopsy tissue from the liver margin satisfactorily represented the total vitamin A content of the liver. A second sample should not be taken from the same area as the first, because such samples had a lower content of vitamin A.

CHANDA, R. (1956). **Effect of L-thyroxine on carotene and vitamin A metabolism in the cow and the chick.**—*Nature, Lond.* **178,** 541-542. **3902**

Daily administration of *l*-thyroxin to 4 cows increased the β-carotene and vitamin A ester content of the milk fat and blood serum. The increase in vitamin A was greater when the hormone was given orally, but the increase in β-carotene was greater when it was given parenterally. Vitamin A alcohol levels remained fairly constant, but rose in the cows receiving the largest doses of thyroxin. The vitamin A ester and alcohol content of the blood of chicks was also increased by thyroxin in the food. The absence of vitamin A in the food and the high concentration of vitamin A in the chicks' intestines indicated a greater than normal conversion of dietary carotene into vitamin A.—M.G.G.

SAFFORD, J. W., SWINGLE, K. F. & MCROBERTS, D. E. (1956). **Muscular dystrophy in lambs as related to the tocopherol levels**

in the plasma and the milk of ewes and to various feeds.—*Amer. J. vet. Res.* **17,** 503-509. **3903**

Muscular dystrophy manifested itself in lambs between the 3rd and 22nd days of age. The incidence increased with the length of time the dams were on suspect rations and decreased when protein was added to the dams' ration; it was not correlated to the tocopherol in the milk and plasma of the ewes. The condition was observed among lambs of ewes on a lucerne hay ration supplemented with barley—it did not occur when lucerne was supplemented with oats or when barley was added to a red clover hay ration. The age of the ewes did not seem to have any influence on the incidence of the disease.—T.E.G.R.

BOUMAN, J. & SLATER, E. C. (1956). **Tocopherol content of heart-muscle preparations.** —*Nature, Lond.* **177,** 1181-1182. **3904**

The amount of alpha-tocopherol in sarcosomal (mitochondrial) fragments of heart muscle was 1·1 μmole per g. protein. It was the only fat-soluble vitamin present in appreciable amount. Crystalline bovine serum albumin contained 0·035 μmole per g. protein.—R.M.

JENSEN, L. S., SCOTT, M. L., HEUSER, G. F., NORRIS, L. C. & NELSON, T. S. (1956). **Studies on the nutrition of breeding turkeys. I. Evidence indicating a need to supplement practical turkey rations with vitamin E.** —*Poult. Sci.* **35,** 810-816. [Authors' summary modified.] **3905**

Results are presented which reveal that for high hatchability turkey breeding rations often require supplementation with vitamin E, and that an unknown factor present in fresh forage juice is also required. The vitamin E requirement is more than 13·6 i.u. per lb. of food, since this was the approx. amount needed in addition to that already in the diet.

JUNGHERR, E. L., SINGSEN, E. P. & MATTERSON, L. D. (1956). **Nutritional encephalomalacia of chickens. Effect of treatment on the pathology.**—*Lab. Invest.* **5,** 120-131. [Authors' summary modified.] **3906**

The neuropathological expressions of nutritional encephalomalacia have been classified as ischaemic, vacuolar, sclerotic, vasculoproliferative and gliotic, of which the first two were considered degenerative and the others reparative, in character. Preventive treatment with N,N'-diphenyl-*p*-phenylene diamine or other antioxidants appeared to cause progressive decline in the incidence of the disease, and at the same time a relative increase of the reparative forms. Further observations are necessary for long-term evaluation of preventive treatment. Experimental treatment of clinically affected chicks at onset of symptoms resulted in apparent recovery of about one half. Examination of these chicks 8 days after recovery disclosed residual lesions, mostly of the reparative type, in about two thirds.

KRATZER, F. H., DAVIS, P. N. & ABBOTT, U. K. (1956). **The folic acid requirements of turkey breeder hens.** — *Poult. Sci.* **35,** 711-716. [Abst. from authors' summary.] **3907**

About 0·7 mg. of folic acid per kg. of food was needed to produce optimum hatchability of turkey eggs. Hatchability was reduced when the hens were fed rations deficient in folic acid. Egg production was not affected, and no gross abnormalities were noted in the hens, but embryo mortality was greatly increased. Most embryos died in the period immediately before hatching at (26–28 days). While many appeared normal grossly, abnormalities of the extremities (micromelia, twisted hocks, defects of the mandible, crossed beak, etc.) and of the circulatory system (haemorrhages, oedema, and distension of the gizzard with fluid) were frequent.

JUBB, K. V., SAUNDERS, L. Z. & COATES, H. V. (1956). **Thiamine deficiency encephalopathy in cats.** — *J. comp. Path.* **66,** 217-227. **3908**

Ten cats examined by the authors presented a syndrome indistinguishable from thiamine deficiency as described in the cat and other species. All the patients had been fed a diet of tinned food containing whole fish. The disease was reproduced by feeding the diet to 4 cats, 2 of which improved rapidly after i/p injection of 1 mg. thiamine hydrochloride during the critical phase, but they relapsed later and were killed *in extremis*. The disease was thought to have resulted from the inactivation of the vitamin by thiaminase, which is present in fish. —L. M. MARKSON.

I. ZUCKER, T. F., ZUCKER, L. M. & SERONDE, J., JR. (1956). **Antibody formation and natural resistance in nutritional deficiencies.** —*J. Nutr.* **59,** 299-308. **3909**

II. SERONDE, J., JR., ZUCKER, T. F. & ZUCKER, L. M. (1956). **Thiamine, pyridoxine and pantothenic acid in the natural resistance of the rat to a corynebacterium infection.** — *Ibid.* 287-298. [Authors' summaries modified.] **3910**

I. A vaccine prepared from killed cultures of *Corynebacterium murium* (*C. kutscheri*) was

administered to rats with various dietary deficiencies: calories, thiamine, pyridoxine or pantothenic acid. With deficiencies of calories or thiamine there was no significant reduction in ability to form agglutinins. No detectable agglutinins were formed in pyridoxine deficiency. In pantothenate deficiency, some rats lost their ability to form agglutinins while this capacity was impaired in others. Ability to form agglutinins was not related to resistance to the live organism.

II. *C. murium* (*C. kutscheri*), which produces spontaneous disease in young rats deficient in pantothenate, failed to do so in rats deficient in either pyridoxine or thiamine, or in rats whose caloric intake was severely restricted. The disease does not appear in healthy rats on a complete diet. This organism caused fatal infection in all of a strain of rats deficient in pantothenate, and in a few rats deficient in pyridoxine or thiamine. Another strain of rats with pantothenate deficiency proved more resistant. A complete diet, even when restricted in quantity, protected the inoculated rat against serious infection.

SØRENSEN, P. H. (1956). **Variations in the concentration of protein-bound iodine in the blood of cattle and pigs.**—*K. VetHøjsk. Aarsskr.* 1956. pp. 64-76. [In English. Author's summary modified.] **3911**

Data are given on variations in the concentration of protein-bound iodine (P.B.I.) in the blood of cattle of different ages and with different butter-fat production, and of cattle and pigs during the seasons of the year. The concentration of P.B.I. in cattle decreased with age. It increased during late pregnancy, and varied greatly at calving time, after which it increased during the next 6 months. In lactating cows a positive correlation between the daily yield of butter-fat and the concentration of P.B.I. was observed. Bullocks, castrated for more than a year, had a decreased conc. of P.B.I. in the blood whereas no decrease was observed in castrated male pigs about 6 months old. Seasonal variations were observed in mature, non-pregnant and non-lactating cows, and in pigs about 6 months old. The highest concentrations were found in autumn and winter.

SØRENSEN, P. H. (1956). **Variations in thyroid secretion rate in milking cows as studied with radioactive iodine. A preliminary report.**—*Nord. VetMed.* **8**, 639-657. [In English. German and Danish summaries. Author's summary modified.] **3912**

A new method for determining the thyroid secretion rate in cattle is outlined. The principle of the method is the determination of the rate constant for the secretion of radioactive hormone-I^{131}, and determination of the specific radioactivity of the thyroid hormone in the blood. On the assumption that the specific radioactivity of the hormone in the blood and that of the secreted hormone are identical, the thyroid secretion rate can be determined. Such determinations in 8 milking cows demonstrate that there is a positive correlation between daily butter-fat production and thyroid secretion rate.

RECANT, L. (1956). **Diminished ketogenesis in liver injury. I.**—*J. Lab. clin. Med.* **48**, 165-170. [Abst. from author's summary.] **3913**

FISCHER, G. L. & RECANT, L. (1956). **A mechanism for diminished ketogenesis in experimental liver injury. II.** — *Ibid.* 171-175. [Authors' summary modified.] **3914**

I. Diminished ketogenesis was observed in rats with liver injury induced by ethionine, and was apparent in both intact animals and in slices of liver. Human beings with cirrhosis of the liver had considerably less ketones after an 18-hour fast than did normal people. Their ketone levels then fell only slightly after the ingestion of glucose in contrast to a striking decrease in the control group.

II. Markedly diminished ketogenesis and decreased butyrate and pyruvate oxidation were demonstrated in mitochondria from the liver of rats with liver injury induced by prolonged feeding of ethionine. Oxygen consumption from substrates intrinsic to the Krebs cycle was only slightly depressed. The observed metabolic defects were not reversed by *in vitro* or *in vivo* supplementation of various co-factors. Impaired activation of acetate is suggested.

ADLER, J. H. (1956). **Grass silage a possible nutritional factor in bovine ketosis.**—*Cornell Vet.* **46**, 446-451. **3915**

Of 22 dairy cows 18 were positive to the Ross test. The silage, of which the animals each ate 50 kg. daily, contained 8 mg./kg. of acetone. The total ketone-body content per kg. expressed as acetone was 410 mg.—M.G.G.

MIXNER, J. P. (1956). **Hormonal implications in ketosis in dairy cattle.**—*Vet. Ext. Quart. Univ. Pa.* No. 143. pp. 108-110. **3916**

M. suggested that ketosis was caused by relative insufficiency of the adrenal cortex induced by hypothyroidism, and not by absolute insufficiency of the adrenal cortex.—R.M.

CARLSTRÖM, G. & HALLGREN, W. (1956). Ett nytt acetonprov. [**A new acetone test.**]—*Medlemsbl. Sver. VetFörb.* **8**, 223 & 225. [In Swedish.] **3917**

In a quantitative comparison, using a specimen of cattle urine having a "total acetone" content of 205 mg.%, a nitroprusside tablet method ("Acetest" tablets) was slightly less sensitive than Legal's nitroprusside test: it yielded a positive reaction in dilutions up to 1:256. It is recommended for use in cattle practice. The reaction is not influenced by the presence of glucose, albumin or creatinine in the urine. [See also *V.B.* **24**, 3607.]—F.E.W.

See also abst. 4001 (book, avian nutrition).

DISEASES, GENERAL

ANON. (1954). **Losses in agriculture. A preliminary appraisal for review.** pp. 190. Washington, D.C.: Agricultural Research Service, United States Department of Agriculture. [ARS-20-1.] **3918**

An attempt is made to estimate the monetary value of the annual losses caused by diseases, parasites, etc., of both plants and animals in the U.S.A. during the period 1942–51. The figures are issued with the warning that they are incomplete, not based on accurate surveys and in many cases represent only the individual judgement of officers of the U.S.D.A.

Chapter I deals with livestock including poultry and the losses are listed under the heads (a) infectious diseases (b) non-infectious diseases (c) nutritional disorders (d) internal parasites (e) arthropod parasites (f) marketing and processing. Very interesting tables are given.

This is an extremely helpful attempt to provide information which is so frequently required and so seldom available. It is to be hoped that it may serve as an example which will be followed by other countries.

MAQSOOD, M. (1956). **Iodinated casein therapy for the "non-sweating" syndrome in horses.**—*Vet. Rec.* **68**, 475. **3919**

Affected horses, it is claimed, were cured by daily administration of 10–15 g. of iodinated casein for 4–8 days.—M.G.G.

BANKOWSKI, R. A., WICHMANN, R. W. & STUART, E. E. (1956). **Stomatitis of cattle and horses due to yellow bristle grass** (*Setaria lutescens*). — *J. Amer. vet. med. Ass.* **129**, 149-152. [Authors' summary modified.] **3920**

A stomatitis indistinguishable from that observed in the field was reproduced in a calf and a horse fed hay obtained from the affected premises. Demonstration of the barbs of *S. lutescens* in the lesions and failure to produce the disease with moulds cultured from the hay established the causal agent.

I. PETRENKO, B. G. & PARFENOVA, K. G. (1954). [**Bovine chronic haematuria. Part V.**]—*Nauch. Trud. ukrain. Inst. exp. Vet.* **21**, 95-113. [In Russian.] **3921**

II. PETRENKO, B. G. (1955). [**Aetiology and pathogenesis of bovine chronic haematuria.**]—*Ibid.* **22**, 149-157. [In Russian.] **3922**

I. Determinations were made of Ca, Fe, Mg, Na and K in the organs of cattle with chronic haematuria and in hay and maize from areas where the disease occurred. Compared with the organs of healthy cattle in non-affected areas, there was less Ca and Fe and more K in the spleen and, to a lesser extent, the liver; there was more Na in kidney and less Mg in muscle. Hay did not vary much, but maize from an affected area contained more Ca and K than maize from a non-affected area.

II. A discussion, based on several years' work on bovine chronic haemturia. Predisposing factors were nutritional deficiency, and the poor quality of the soil in mountain regions, particularly deficiency in Ca. The main causal factor was the presence in the food of an undefined toxic substance. A contributory factor was functional disturbance of the kidneys.

—R.M.

MARTINČIĆ, M. (1955). Krvavo mokrenje goveda. Haematuria vesicalis cancerogenes bovis. [**Haematuria in cattle.**]—*Veterinaria, Sarajevo.* **4**, 525-620. [In Croat. English summary.] **3923**

A detailed review of the aetiology, clinical picture and pathology of bovine chronic haematuria, with 57 photomicrographs and 211 references.—E.G.

BOHROD, M. G. (1956). **Periarteritis nodosa in an American deer.**—*Arch. Path.* **62**, 17-22. [Author's summary modified.] **3924**

Typical periarteritis nodosa lesions were found in the soft tissues around a year-old shot wound and fracture in a deer. The facts are reviewed concerning a report (Lüpke, 1906) of an epidemic of periarteritis nodosa in a herd of deer in Germany. It is suggested that the frequency of periarteritis nodosa in deer is due to a special predisposition, probably hereditary, to

hypersensitivity reactions or to their arterial localization or to both; and that the apparent epidemic form is the result of some epidemic disease, which stimulates the production of periarteritis nodosa lesions. It is urged that those who have an opportunity to study deer tissues make the observations necessary to prove or disprove this hypothesis.

CHESNEY, R. W. L. (1956). **"Staggers" in sheep. A review of some of the relevant information.**—*Brit. vet. J.* **112,** 389-403. **3925**

C. described incoordination of movement in sheep, and the accompanying symptoms and P.M. lesions, associated with poisoning by plants and chemicals, bacterial and virus infections, parasitic infestation and diseases of unknown origin.—M.G.G.

ANON. (1956). GREAT BRITAIN. **Report on diseases of farm livestock. Section V. The husbandry and diseases of pigs.** pp. 203. London: British Veterinary Association. (Publ. No. 14.) 3rd Edit. **3926**

This handbook is a great improvement on previous editions. It has almost twice the number of pages, as a result of the addition of new material, including articles on leptospirosis, agalactia, diarrhoea, baby pig disease, atrophic rhinitis, terminal ileitis, streptococcal meningitis, and neoplasms. Another useful addition is the subject index. Many other articles have been revised.—R.M.

KERRUISH, D. W. (1956). **Atrophic rhinitis in pigs other than Landrace.** — *Vet. Rec.* **68,** 541-544. [Author's summary modified.] **3927**

A condition indistinguishable from atrophic rhinitis was found in about 10% of the snouts of 1,000 pigs slaughtered in the Isle of Man. Examination of the herds concerned revealed clinical signs of atrophic rhinitis. Lateral deviation of the snout in the live animals was not observed. Lateral deviation of the bones of the snout was noted in pigs of both Irish and Manx origin.

HAUPTMAN, B. & JÓZEFÓW, W. (1956). Zakaźne zapalenie żołądka i jelit (dyzenteria) świń w P. G. R. Zjednoczenie Cieplice i Legnica. **[Infectious gastro-enteritis in pigs in Poland.]** —*Méd. vét., Varsovie.* **12,** 332-335. [In Polish. English and Russian summaries.] **3928**

The authors investigated outbreaks of swine dysentery in Poland involving over 3,000 pigs. The losses were heavier than in swine fever outbreaks. Response to treatment with arsenical preparations, streptomycin and sulphonamides varied, and outbreaks in unweaned piglets, where frequent relapses took place, were far more difficult to control than in fattening animals. Piglets that recovered were seldom thrifty. Slaughter of affected animals and isolation and treatment of "in-contacts" proved the best method of control—M. GITTER.

RISTIC, M., SANDERS, D. A. & WALLACE, H. D. (1956). **Seborrhea oleosa in pigs.**—*Vet. Med.* **51,** 421-422. **3929**

The condition is non-infectious and of unknown aetiology. It was observed in 41 piglets aged 6 days to 4 weeks and was characterized by reddish, scale-like crusts and large symmetrical flakes in the abdominal and cervical regions and around the nostrils and ears. Underneath the scabs was an oily, wax-like substance which, on removal, revealed a reddish oily area of hairless skin with an unpleasant, rancid odour. There was inappetance, unthriftiness and impairment of vision and, in the majority of cases, death in 2–3 weeks. Treatment with zinc carbonate added to the diet was ineffective.—T.E.G.R.

MARKWARDT, H. (1956). Kompressionsstenose der Speiseröhre bei einem Schwein. **[Compression stenosis of the oesophagus in a pig.]** —*Mh. Vetmed.* **11,** 344-346. **3930**

The clinical, radiographic and P.M. findings were briefly described in a case caused by an abscess from which *Corynebacterium pyogenes* was isolated.—M.G.G.

HERMANEK, P. & SLAPAK, L. (1956). Über spontane seröse Endokarditis des Kaninchens. **[Spontaneous serous endocarditis in rabbits.]** — *Schweiz. Z. allg. Path.* **19,** 318-330. [English and French summaries.] **3931**

Serous endocarditis was observed in 13 apparently healthy rabbits. It took the form of nodules on the mitral valves and sometimes also on the aortic valves.—R.M.

JOHNSON, A. S. (1956). **Incidence of an abnormal hock condition in male turkeys as influenced by genetic differences and by hatch.**—*Poult. Sci.* **35,** 790-792. [Author's summary modified.] **3932**

A condition of enlarged hocks or perosis, often with lameness, and occurring at 16 to 20 weeks of age, was observed in a flock of male turkeys. The incidence varied, among three hatches, from 5·6 to 28·5%, and, among the progeny of 20 sires, from 0 to 71·4%. There was no correlation between incidence and the body wt. at 12 weeks. However, the lowest

incidence occurred in the hatch with the lowest early growth rate. Further work on the aetiology is needed.

West, J. L. (1955). **Osteomyelitis; another cause of nervous disturbances in poultry.**—*Proc. N. Cent. St. Poult. Dis. Conf., Purdue Univ., Lafayette, May* 17 & 18, 1955. pp. 40-42. [Mimeographed.] **3933**

Osteomyelitis affecting cranial and spinal bones was associated with nervous symptoms in fowl and turkeys. The lesions are described; the pathogenesis was obscure.

—F. T. W. Jordan.

Bierer, B. W. (1956). **Keratoconjunctivitis in turkeys: a preliminary report.**—*Vet. Med.* **51,** 363-366. **3934**

A disease of adult turkeys was characterized by inflammation of the eyelids and in the more advanced stages ulceration of the anterior portion of the eyeball. The number of birds affected in a flock varied from an insignificant number to 40%. The cause is unknown, and may be one of the following: bacterial infection, fowl pox, *Aspergillus* infection, nutritional deficiency, effect of strong artificial light, or *Oxyspirura mansoni* infection.

—M.G.G.

Bras, G. & Hill, K. R. (1956). **Veno-occlusive disease of the liver. Essential pathology.** —*Lancet.* **271,** 161-163. [Authors' summary modified.] **3935**

The lesions of veno-occlusive disease of the liver appear to surround blockage of the hepatic veins. For this reason it is suggested that other names—serous hepatosis, collagenosis—used earlier to describe this condition be abandoned and that only the term veno-occlusive disease be used. Progressive cases eventually develop non-portal cirrhosis (often with fatal haemorrhage from the oesophageal varices). The pancreas has lesions which are commonly associated with protein deficiency.

See also abstr. **4002 & 4004** (books, diagnosis); **4003** (book, pathology); **4005** (book, treatment of internal diseases).

POISONS AND POISONING

Delany, L. T., Schmidt, H. W. & Stuoebel, C. F. (1956). **Silo-filler's disease.** — *Proc. Staff Meet. Mayo Clinic.* **31,** 189-198. **3936**

Respiratory symptoms in two farmers, one of whom died, were attributed to poisoning with nitrogen dioxide formed in recently-ensiled maize. Death amongst piglets and fowls, observed soon after filling silos, may have been due to poisoning with this gas.—R.M.

Davies, G. M. & Lewis, I. (1956). **Outbreak of food-poisoning from bread made of chemically contaminated flour.** — *Brit. med. J.* August 18th. 393-398. **3937**

Poisoning in 59 human beings, characterized by fits and convulsions, was traced to bread made from flour contaminated with the insecticide endrin, while in transit from miller to baker. All the patients recovered. Some bread was given to 12 fowls, all of which died. A loaf contained 0·015% endrin and some flour contained 0·55%.—R.M.

Sarkisov, A. K. (1954). **[Mycotoxicoses. (Fungal poisoning).]** pp. 216. Moscow: Gosud. izd. sel'skokhoz. lit. 70 r. 80 k. [In Russian.] **3938**

This book presents full accounts of disease in farm animals caused by ergot, *Claviceps paspali*, smut and rust fungi, mouldy food, *Stachybotrys alternans* (stachybotriomycosis), *Dendrodochium toxicum* (dendrodochiotoxicosis), *Fusarium graminearum*, ("drunken bread"), *F. sporotrichioides*; and a disease referred to as "suilyuk." The latter has not been traced to any one fungus and may be a mixed fungal intoxication; it is characterized by non-contagious broncho-pneumonia of horses and occasionally cattle, following ingestion of mouldy forage [see also *V.B.* **15,** 559; **16,** 24; **20,** 2221-24]. *Fusarium sporotrichioides* develops in grain crops which have been wintered in the field under snow. It causes a disease in man known as "septic angina," but it causes a less severe form in animals, characterized by anaemia.

Each disease is described under the headings: definition, history, aetiology, pathogenesis, clinical picture, pathology, differential diagnosis, treatment, prevention and control. There is a bibliography at the end of each chapter—a feature only too often omitted in Russian publications. The book contains much information which has hitherto been confined to reports unobtainable outside the U.S.S.R. An English translation would be of great value to veterinary mycologists.

It is a companion volume to the "Atlas of fungi pathogenic for farm animals" [see *V.B.* **26,** 2758]; both were produced at the All-Union Research Laboratory for the Study of Toxic Fungi, founded in 1939 in Moscow.—R.M.

SARKISOV, A. K. (1954). [*Dendrodochium toxicum* **intoxication of horses.**] In [Mycotoxicoses. (Fungal poisoning).] pp. 110-119. [Moscow: Gosud. izd. sel'skokhoz. lit.] [In Russian.] **3939**

This intoxication of horses, first reported in 1937, is localized, being mainly confined to the Zaporozhe and Dniepropetrovsk regions of the Ukraine, and it occurs only towards the end of the winter stabling period. Natural and experimental cases are characterized by sudden death, without preliminary symptoms. P.M. examination reveals cyanosis of mucous membranes, a pallor of organs, oedema and petechiae in the lungs; the blood in large organs is partly clotted and dark red; the stomach is sometimes distended with food; the spleen is not enlarged. No specific changes are observed on histological examination.

It is caused by the feeding of damp, poor-quality fodder, infected with *D. toxicum*. This fungus produced a heat-stable toxin, soluble in water, alcohol and ether, which differed from that of *Stachybotrys alternans* in its resistance to treatment with hot solution of ammonia. The toxin depresses the circulatory system, causing a fall in blood pressure and constriction of peripheral blood vessels. Preventive measures are aimed at providing dry, good quality fodder.

—R.M.

DONALD, L. G. & SHANKS, P. L. (1956). **Ragwort poisoning from silage.**—*Brit. vet. J.* **112,** 307-311. [Abst. from authors' summary.] **3940**

An outbreak of poisoning from *Senecio jacobaea* in silage concerned 249 yearling and 22 two-year-old cattle. The first case occurred 10 weeks after silage feeding began. The silage was immediately stopped, but 61 cattle died and 32 more were slaughtered after showing symptoms during the next 5½ months. Four months later 5 out of 12 animals slaughtered had gross cirrhosis of the liver.

MCGIRR, J. L. (1956). Maladies et accidents causés, chez le bétail, par diverses substances utilisées dans la pratique agricole. **[Toxicity for livestock of various chemicals used in agriculture.]** — *Bull. Off. int. Epiz.* **46,** May. pp. 244-257. [English summary.] **3941**

Some of the sources of chemical poisoning in farm animals are discussed. These include: lead, a common ingredient of paints—it may be licked, especially by calves, and it may contaminate food and drinking water; arsenical compounds used as insecticides, parasiticides and weed killers; copper compounds, used as fungicides, vermicides and mineral supplements; various rat poisons; chlorinated hydro-carbons, such as D.D.T., aldrin, dieldrin, etc.; organophosphoric insecticides; the di-nitro group of insecticides and weed killers; and, the so-called hormonal weed killers, which are considered non-toxic but may cause poisoning by rendering poisonous weeds attractive to stock.—T.E.G.R.

DALGAARD-MIKKELSEN, S. (1956). Maladies et accidents chez le bétail causés par les insecticides et herbicides utilisés dans la pratique agricole. **[Toxicity for livestock of parasiticides and weed killers used in agriculture.]** —*Bull. Off. int. Epiz.* **46,** May. pp. 232-243. [English summary.] **3942**

Poisoning by parasiticides of the thiophosphate and chlorinated hydrocarbon groups and dinitrophenol and hormonal weed killers is discussed. An account is given of toxicity among 102 cattle due to spraying with a 2% parathion powder. There were 5 deaths and 8 cows in advanced pregnancy aborted. Antidotal treatment consisted of atropine and magnesium chloride [doses and methods of administration not stated]. Chlorinated hydrocarbon poisoning is rare in Denmark because compounds of this group are no longer in common use.

—T.E.G.R.

See also absts. **3882** (toxicity of isopropyl phenylcarbamate-treated potatoes); **3925** ("staggers" in sheep); **4006** (book, poisonous plants of Western Australia).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease).

THEVE, N. O. (1956). Blodbank för hundar—några synpunkter. **[A blood transfusion service for dogs.]** — *Nord. VetMed.* **8,** 529-538. [In Swedish. English and German summaries. Abst. from English summary.] **3943**

The blood is stored at 4°C. as citrated blood. It must be used within 10 days. Calcium gluconate is given with the blood infusion, to compensate for the lowering of ionised calcium in the blood. There is no need to determine blood groups at the first transfusion. If more than one transfusion is made, the cross test must be carried out.

GALL, Z. (1955). Djelovanje tetraklormetana (carbonei tetrachloridum) na odnos anorgan-

skih tvari u serumu, serumske bjelančevine i protrombinsko vrijeme kod goveda i ovaca. [**Effect of carbon tetrachloride on inorganic serum constituents, serum proteins and prothrombin time in cattle and sheep.**]—*Veterinaria, Sarajevo.* **4,** 402-431. [Thesis, Sarajevo.] [In Croat. English summary.] **3944**

Serum calcium content decreased by 15% in cattle and 23% in sheep 24 hours after the administration by stomach tube of carbon tetrachloride. Potassium levels increased in cattle by 24·8%, and in sheep by 26·6%. Phosphorus levels decreased within 6 hours by 16% in cattle and by 15·5% in sheep. Magnesium decreased in cattle by 6·2% and in sheep by 41·7% after three days.

There was an 18% decrease in alpha$_2$ globulin in cattle and a 20·5% decrease in sheep within 24 hours of application. Gamma globulin levels in cattle and sheep increased by 19% and 20% respectively. Total serum protein was increased in cattle but decreased in sheep. Prothrombin time was more than doubled in both cattle and sheep.—E.G.

KELLY, W. R. (1956). **Thoughts on the place of antibiotics in veterinary medicine.**—*Irish. vet. J.* **10,** 46-56; 66-73. **3945**

A brief review of the development of antibiotics is followed by a discussion of:— the choice and indications of antibiotics; combinations of antibiotics; route of administration; selective absorption by tissues; mechanism of action; preservation and frequency of administration; disadvantages and changes arising from antibiotic treatment; and, clinical uses of antibiotics.—T.E.G.R.

WAKSMAN, B. H. & GROUPÉ, V. (1956). **Suppressive activity of xerosin on allergic and other inflammatory reactions of the skin in guinea pigs.**—*J. Immunol.* **77,** 47-51. [Authors' summary modified.] **3946**

Parenteral injections of xerosin [an antibiotic prepared from *Achromobacter xerosis* (*V.B.* **25,** 1044)] in g. pigs reduced markedly the tuberculin reaction and the inflammatory response to turpentine. The reversed passive Arthus reaction and the inflammatory response to urease were moderately reduced. Xerosin did not affect the histamine weal or the weal and flare of passive cutaneous anaphylaxis. Diffusion of a macromolecular dye in the skin was greatly inhibited.

PAARMANN, E. (1956). Die Prüfung der Konzentration der zur Desinfektion hergestellten Natronlauge in der Praxis der Amtstierärzte oder Ordnungsämter. [**The assay of caustic soda solutions used for disinfection in veterinary state practice.**]—*Berl. Münch. tierärztl. Wschr.* **69,** 150-151. [English summary.] **3947**

Simple determination of the pH of caustic soda solutions by means of indicator papers is inadequate, owing to possible distortion of the results by the presence of other alkalis, notably $Ca(OH)_2$. The author therefore describes a relatively simple, practical and sufficiently accurate method of rough quantitative analysis involving sedimentation or filtration of the insoluble $Ca(OH)_2$, followed by titration with HCl, using a soluble indicator such methyl orange.—G. P. MARSHALL.

See also absts. **3664** (antistaphylococcal antibiotics); **3668** (procaine in mastitis); **3670-3671** (penicillin in acute bacterial infections); **3679** (effect of cetylpyridium chloride on M. tuberculosis); **3680** (TB.); **3693** (dihydrostreptomycin in E. rhusiopathiae infection in pigeons); **3710** (treatment of chronic salmonellosis in pigeons); **3732** (chloramphenicol in diphtheroid stomatitis); **3738** (erythomycin in actinomycosis); **3758** (furazolidone in blackhead); **3759** (nitrofurazone); **3762** (anaplasmosis); **3793** (ovine virus abortion); **3794** (scrapie); **3805** (porcine virus pneumonia); **3811** (feline pneumonitis); **3814** (psittacosis); **3843** (demodectic mange in dogs); **3847-3848** (molluscicides); **3850, 3855-3856 & 3860** (anthelmintics); **4005** (book, treatment of diseases); **4007** (book, oxytetracycline).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

CRUICKSHANK, A. H. & WILSON, H. (1956). **Lymph-node extracts and lymphocytosis: failure to produce blood lymphocytosis with extracts of lymph-nodes.**—*J. Path. Bact.* **71,** 375-381. [Authors' summary modified.] **3948**

Experiments in which g. pigs were injected s/c and rabbits i/v with extracts of human or bovine lymph nodes failed to confirm the assertion (Meyerhof, 1940) that lymph nodes contain an active principle which causes blood lymphocytosis.

BLACKBURN, P. S. (1956). **The periductal lobules of the bovine mammary gland.**—*Brit. vet. J.* **112,** 366-369. [Author's summary modified.] **3949**

The distribution of periductal lobules in the bovine udder was studied by means of a cardboard reconstruction of the finer ducts. The lobular duct of a periductal lobule drains directly into a larger duct in contrast to the lobular ducts of terminal lobules, several of which unite to form a larger duct. Periductal

lobules were found around all the ducts of the udder. Such lobules in the walls of the teat cistern and gland cistern have been known in the past as accessory glands.

BENSON, G. K. & COWIE, A. T. (1956). **Lactation in the rat after hypophysial posterior lobectomy.** — *J. Endocrin.* **14,** 54-65. [Authors' summary modified.] **3950**

Ablation of the posterior lobe of the pituitary gland in lactating rats abolished the milk-ejection reflex. The offspring could be reared only if injections of oxytocin were given to the mothers twice daily. When these rats became pregnant a second time, however, parturition was normal and the milk-ejection reflex restored. However they still had diabetes insipidus. Measurements of residual neurohypophyseal tissue showed that hypertrophy of the neural stalk had occurred. These findings are discussed in relation to recent studies on the site of formation and the liberation of posterior-pituitary hormone(s) after hypophysectomy.

BRADLEY, T. R. & CLARKE, P. M. (1956). **The response of rabbit mammary glands to locally administered prolactin.**—*J. Endocrin.* **14,** 28-36. [Abst. from authors' summary.] **3951**

Milk was clearly detectable in the mammary glands of rabbits by the 3rd day after intraductal injection of prolactin, with evidence of a bigger response with increased dose; but there was wide variation between individuals. Injection of other pituitary extracts did not lead to milk formation.

SCHULZE, W. & HABURA, D. (1955). Kritische Betrachtungen über die Haemoglobinbestimmung mit der Sahlimethode im Vergleich zur Cyanhaemiglobinmethode nach Betke-Savelsberg bei Hund und Ziege. [**Determination of haemoglobin in the dog and goat by Sahli's method compared with the cyanhaemoglobin method of Betke & Savelsberg.**]— *Arch. exp. VetMed.* **9,** 380-404. **3952**

Although the more recent Pulfrich method of haemoglobin determination eliminates many of the errors of the Sahli method, the photometric assay method, using cyanhaemoglobin, described by Betke & Savelsberg (1950), is more accurate, and is to be recommended for veterinary practice.—F. R. PAULSEN.

JOHNSTONE, F. R. C. (1956). **Measurement of splanchnic blood volume in dogs.**—*Amer. J. Physiol.* **185,** 450-452. [Author's abst. modified.] **3953**

The splanchnic blood volume of 10 dogs was measured, the method employing P_{32}-labelled red cells and requiring evisceration of the animals. On the average it was 21·7% of the volume of the circulating blood, or 17·7 ml. per kg. of body weight.

HANDLER, J. J. (1956). **The foetal circulation and its changes at birth in some small laboratory animals.**—*J. Physiol.* **133,** 202-212. [Author's summary modified.] **3954**

The course of the foetal circulation in full term dog foetuses, delivered by caesarian section, was similar to that previously described in sheep, as shown by cineangiography. Positive pressure ventilation of the lungs of full term foetuses from dogs, cats and rabbits usually caused a fall in blood pressure, which was attributed to an increase of pulmonary vascular conductance. In rabbit foetuses which were partly asphyxiated, because umbilical blood flow had almost ceased, ventilation caused a rise in blood pressure. In new-born puppies the pulmonary vessels filled more rapidly and more completely after ventilation. Contrast medium passed in either direction through the ductus arteriosus according to the site of injection, although the pulmonary arterial pressure was less than that in the descending aorta. There is no valve at the aortic end of the ductus arteriosus in dogs and rabbits.

MICHEL, G. (1956). Beitrag zur Topographie der Ausführungsgänge der *Gl. mandibularis* und der *Gl. sublingualis major* des Hundes. [**The excretory ducts of the mandibular and sublingual salivary glands in the dog.**]— *Berl. Münch. tierärztl. Wschr.* **69,** 132-134. [English summary.] **3955**

M. studied the mandibular and sublingual glands and their excretory ducts in 30 dogs. The orifice of the mandibular duct opened into a sublingual fold near the frenum of the tongue in an indistinct papilla. In about 20 dogs the orifice of the sublingual duct was near that of the mandibular duct; in the remainder the two ducts had a common orifice.—E.G.

ARCHIBALD, J. & CAWLEY, A. J. (1956). **Some observations on transplantation of the canine kidney.** — *Amer. J. vet. Res.* **17,** 376-379. **3956**

Kidneys transplanted from one dog to another lived longer if the dog was given adrenocorticotrophic hormone daily after the operation. Kidneys transplanted after storage for 24 hours in a refrigerator functioned for a much shorter period than freshly-transplanted kidneys, before undergoing degenerative changes.—R.M.

DYCE, K. M. (1956). **Intravenous cholecystography in the dog.**—*X-ray Focus.* **1,** No. 2. pp. 7-8. **3957**

D. described the demonstration by X-rays of the gall-bladder and bile ducts, following i/v inj. of "Biligrafin" (an organic iodine compound), and the normal anatomical picture of these structures in the dog. There are 2 radiographs.—R.M.

See also abst. 4008 (annual review of biochemistry).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

WELCH, H., JESTER, W. R. & BURTON, J. M. (1956). **Antibiotics in fluid market milk. Third nationwide survey.** — *Antibiot. & Chemother.* **6,** 369-374. [Spanish summary p. 383.] [Authors' summary modified.] **3958**

Samples of raw and pasteurized milk, collected from throughout the U.S.A. and the District of Columbia, were examined for antibiotic residues. Penicillin in concentrations of 0·003–0·55 units/ml. was found in 101 (5·9%) ot the 1,706 samples. One of these samples also appeared to contain streptomycin. The presence of penicillin was confirmed by the penicillinase identity test. Seventeen samples appeared to contain bacitracin, one of the tetracyclines, or a combination of two of these drugs. It is suggested that antibiotic residues in milk are largely the result of using the milk from cows treated for mastitis.

COSNETT, L. S., HOGAN, D. J., LAW, N. H. & MARSH, B. B. (1956). **Bone-taint in beef.**—*J. Sci. Fd Agric.* **7,** 546-551. [Authors' summary modified.] **3959**

Large numbers of Gram-positive rods were present in smears from each of 24 sides of bone-tainted beef. At least 12 different organisms, including anaerobes, sporing aerobes and non-sporing aerobes, were isolated from 14 of the sides. Evidence is presented to suggest that neither bone-marrow nor synovial fluid is the centre from which the tainting organisms spread. The ischiatic and popliteal lymph nodes of freshly-killed cattle frequently contain bacteria, many of them Gram-positive rods. The incidence of nodes containing these rods appears to be related to the rainfall during the 2 months preceding slaughter. It is suggested that Gram-positive rods enter abrasions in the skin of the cattle and are localized in the lymph nodes. After death, given suitable temperature and pH requirements, the organisms multiply and spread outwards to the neighbouring muscles producing taint.

LIEBERMAN, J. & HELVIG, R. J. (1956). **New horizons in animal-human health relationships.**—*Roy. Soc. Hlth. J.* **76,** 452-459. **3960**

A discussion of the responsibilities of the veterinary surgeon with public health training, in food hygiene, diseases transmissible from animals to man, experimental medicine and surgery, and the production of vaccines and sera.—R.M.

See also abstr. **3661** (staphylococcal mastitis in goats causing epidemic in man); **3662** (toxicity of mastitis staphylococci for man); **3703-3705** (salmonella species in meat in Germany); **3768** (F. & M. diseases Research Institute, Pirbright); **3791** (orf in sheep, rabbits and man); **3810** (Rubarth's disease in man); **3937** (poisoning in man from chemically contaminated bread); **3961** (animal housing and public health).

LIVESTOCK HYGIENE

KING, J. O. L. (1956). **Animal housing in relation to public health.**—*Roy. Soc. Hlth. J.* **76,** 460-467. **3961**

A discussion of the importance of cleanliness and good ventilation in animal buildings, of the necessity for a pure water supply for use in dairies, and on the infection of pastured cattle with *Cysticercus bovis* from sewage.

—R.M.

MERLE, A. (1956). **Standardization of sanitary regulations in the international trade in livestock.**—*Bull. Off. int. Epiz.* **46,** May. pp. 315-322. [In French pp. 307-314.] **3962**

Two health certificates were drafted by a commission appointed to study and report on the standardization of sanitary regulations in the international trade in livestock. The diseases covered are F. & M. disease and bovine TB. (other diseases will probably be included if this type of certification is approved). In the case of breeding stock an individual certificate for each animal will be required. A collective certificate for each cargo will suffice in the case of slaughter animals. Certificates will be in two languages—that of the exporting country and that of the importing country.—T.E.G.R.

SOUTHGATE, B. A. (1956). **Synthetic detergents and the treatment of water and sewage.** — *Nature, Lond.* **178,** 118-119. **3963**

Since 1949 the use of synthetic detergents in the home has increased threefold in Great Britain. Frothing has become a serious problem in many sewage works. Moreover, surface-active agents of the alkyl aryl sulphonate type resist bacterial attack and pass with the effluent into a river. One of the recommendations of a recent report—Report of the Committee on Synthetic Detergents (H.M. Stat. Off., London, 1956)—is that manufacturers should attempt to produce detergents which are readily decomposed by sewage treatment.—M.G.G.

REPRODUCTION AND REPRODUCTIVE DISORDERS

ROWSON, L. E. A. (1955). **Recent developments in artificial insemination.**—*Vet. Rec.* **68,** 484. **3964**

Work on glycine as a deep-freeze and normal diluent is regarded as a promising development, but further work on a larger scale is needed. Judgement is deferred on heterospermic insemination (using mixed semen from two or more individuals of different breed) for which spectacular results were claimed by Russian workers—Abulkhanov (1950), Arakelyan (1952), Grachev (1953), Kushner (1948), Lukina (1952), Mamyedyarov (1952), Merkuryeva (1951), Stoyanovskaya (1952).—F. L. M. DAWSON.

I. HERRNLEBEN, H. -G. (1954-55). Vergleichende elektronenmikroskopische Untersuchungen an Spermien verschiedener Haussäugetiere. **[Comparative electron microscopic study of spermatozoa of domestic mammals.]** —*Wiss. Z. Humboldt-Univ.* **4,** 367-378. [English, French and Russian summaries.] **3965**

II. KESSLER, H. (1954-55). Elektronenmikroskopische Untersuchungen an Spermien verschiedener Haussäugetiere mit einigen physiologischen Betrachtungen. **[Electron microscopic study of spermatozoa of domestic mammals, with some physiological observations.]**—*Ibid.* 380-394. [English, French and Russian summaries.] **3966**

I. H. examined by electron microscopy the spermatozoa of sheep, goat, pig, camel, donkey and rabbit. The spiral of the middle piece was apparently made up of 3 bands. There are 23 photomicrographs.

II. K. studied the spermatozoa of sheep, goat, pig and rabbit after the spermatozoa had been partly disintegrated by mechanical or chemical means. He discussed the structure of the tail in relation to its function. There are 19 photomicrographs.—R.M.

SALISBURY, G. W. (1956). **The function of the epididymis of the bull. I. A theory for the activation of spermatozoan motility.** —*Tijdschr. Diergeneesk.* **81,** 616-623. [In English, French, German and Dutch summaries.] **3967**

Evidence is adduced from others' work that spermatozoa high in the epididymis contain no free water. S. postulated that first a slow shift in mineral balance takes place, to increase the permeability of the cell wall, thus admitting water, and dissolved oxygen or carbohydrate substrate yielding energy for motility. His own work indicates that the osmotic pressure of the environment of spermatozoa in the male tract is hypertonic, thus inhibiting motility. Practical applications in artificial insemination, it is suggested, might follow elucidation of this problem.
—F. L. M. DAWSON.

ORTAVANT, R. & THIBAULT, C. (1956). Influence de la durée d'éclairement sur les productions spermatiques du bélier. **[Influence of length of day on semen production in the ram.]**—*C.R. Soc. Biol., Paris.* **150,** 358-361. **3968**

It is claimed that no previous experimenter on this question kept control animals. Sixty three rams were used and work was spread over the whole year by means of dark sheds and daylight lamps. Yeates' (1949) results were confirmed that in absence of other detectable variable, semen production varied inversely as the proportion of the day during which the rams were illuminated. No variation in activity of interstitial cells could however be detected.
—F. L. M. DAWSON.

HULET, C. V., EL-SHEIKH, A. S., POPE, A. L. & CASIDA, L. E. (1956). **The effects of shearing and level of feeding on fertility of rams.**—*J. Anim. Sci.* **15,** 617-624. **3969**

Twenty rams each in 1953 and 1954 were divided into grain supplemented and roughage fed groups. Half of each group was shorn monthly, the other half annually. The conception rate of the monthly sheared rams was significantly the higher, and their early foetal death rate the lower. Feeding level did not affect fertility.—F. L. M. DAWSON.

PEPPER, H. & LINDSAY, S. (1956). **Elevation of platelets in mid-cycle: an indication of ovulation.**—*Science.* **124,** 180-181. **3970**

Variations in platelet levels during repeated menstrual cycles were studied and correlated

with the time of ovulation (determined by basal temperature records). The peaks at mid cycle were sharp and characterized by a sudden rise in a 24-hour period. It is considered that platelet levels are a better indication of ovulation than the basal temperature graphs.—T.E.G.R.

NELLOR, J. E. & COLE, H. H. (1956). **The hormonal control of estrus and ovulation in the beef heifer.**—*J. Anim. Sci.* **15,** 650-661. **3971**

The aim was to devise a technique for bringing a whole batch of cattle into oestrus with normal ovulation, at a specified date, using a minimum number of injections per head. The 179 heifers used were each given a single injection of crystalline progesterone, 540 or 1,120 mg., in starch emulsion to ensure uniform dosage. In 122 of these, after 15 days 2,140 i.u. of equine follicle stimulating hormone (F.S.H.) was given subcutaneously. In 6 or 7 heifers on the low dose, oestrus and ovulation appeared to be synchronized within 3 days, 17–19 days later, and irrespective of cycle stage when injected. On the higher dose, synchronisation was less good—6 day range. In a group of fat (1,500 lb.) heifers, ovulation failed. The F.S.H. dose produced 50% double or triple ovulations, and was thus excessive. Conception rate was only 17% this being ascribed either to the effect of high exogenous progesterone or to excessive F.S.H.—F. L. M. DAWSON.

OVERBEEK, G. A. & VISSER, J. (1956). **A new substance with progestational activity. II. Pharmacological properties.** — *Acta endocr., Copenhagen.* **22,** 318-329. [In English.] **3972**

Methyloestrenolene (17 alpha-methyl-19 nor-testosterone) had a potent progesterone-like action when given by mouth to lab. animals. It did not produce a relaxing effect on the pelvic symphysis, and was not toxic.—R.M.

LIKAR, I. N. (1956). **The use of oestrogenic hormones and heterogeneous synthetic substances with oestrogenic action.**—*Brit. vet. J.* **112,** 242-246. **3973**

The extent of effect produced varies according to the species of the animal, where different species have the same size. The effect also varies profoundly with the solvent used as well as the concentration. The differences of effect between natural and synthetic oestrogens are stressed and the use of the synthetic ones for veterinary gynaecological purposes is deprecated. [No good case is made out for this deprecation.]—F. L. M. DAWSON.

BOLEY, L. T. (1956). **Field case report on the use of pregnant mare serum.**—*Vet. Med.* **51,** 372. **3974**

Two trials were made involving 100 sows and about 4 boars. No control was kept, but the pig owners were satisfied that 500 i.u. intramusclarly improved both conception rate and litter size.—F. L. M. DAWSON.

DICZFALUSY, E., BORELL, U., MAGNUSSON, A.-M. & WESTMAN, A. (1956). **Distribution and probable mode of prolonged action of poly-oestradiol phosphate (PEP) in spayed mice.**—*Acta endocr., Copenhagen.* Suppl. 24. pp. 52. [In English.] **3975**

A study of the distribution in the blood and organs of mice of poly-oestradiol phosphate, labelled with radioactive phosphorus, after s/c or i/v injection. The prolonged action of this oestrogen was probably due to the maintenance of a high concentration in the blood: it did not result from its accumulation in the liver.—R.M.

ANON. (1956). Belgium. Comité voor steriliteitsbestrijding Veeartsenijschool, Gent. Verslag over het werkjaar 1955. **[Belgium. Committee for control of sterility, Veterinary College, Ghent. Annual Report for 1955.]** —*Vlaam. diergeneesk. Tijdschr.* **25,** 40-55. [In Flemish. English summary.] **3976**

Out of 180 infertile bulls, *Vibrio fetus* infection was diagnosed in 51, *Trichomonas foetus* infection in 27, and infection with both organisms in 8. Direct diagnosis of *V. fetus* infection in bulls was achieved by culturing, on a solid medium containing brilliant green, the supernatant portion of broth washings of the prepuce. The conception rate of non-immune heifers, mated to infected bulls, was never normal. The application of antibiotic ointments to the vulva just before service did not prevent the infection of virgin heifers by infected bulls. 73 out of 89 cows, infected with *V. fetus,* became pregnant when inseminated after a sexual rest of 3–4 months.

Stasis of spermatozoa in the epididymis accounted for loss of fertility in a boar and a bull. Addition of skim-milk to a protein-deficient diet had a beneficial effect on growth and sexual maturity in gilts. Swelling of the vulva of gilts in a herd was traced to an oestrogenic factor present in the food. Defective ejaculation in 19 Belgian stallions was attributed to obesity, daily transport for long distances, and to unusual sensitivity to being placed in strange surroundings; it responded to changes in management.—R.M.

I. Ullner, W. (1956). Die Hodenbiopsie in der Diagnostik. **[Testicular biopsy in diagnosis.]**—*Proc. IIIrd Int. Congr. Anim. Reprod. Cambridge. Sect.II.* pp. 73-75. [English summary.] **3977**

II. Ullner, W. (1956). Die Hodenbiopsie in der Fertilitätsdiagnostik und ihre Technik. **[Testicular biopsy in the evaluation of fertility.]**—*Berl. Münch. tierärztl. Wschr.* **69,** 201-205. [English summary.] **3978**

I. & II. U. considers testicular biopsy to be a useful adjunct to clinical examination and assessment of semen quality in disturbances of fertility in valuable bulls. He described the surgical technique, with emphasis on the need for the highest degree of asepsis and for complete haemostasis. The use of antibiotics should be restricted to the skin suture. Details are given of the preparation of the biopsy sample, and of its examination. Nine photomicrographs of biopsy material, not included in the Congress report, are reproduced in the second paper. U. considers that an important application, with regard to prognosis and treatment, consists in the differentiation between blockage of the germinal epithelium and disturbances of spermiogenesis as causes of aspermia. [Blockage of these ducts is not generally considered to be an important condition.]—F. L. M. Dawson.

Ottino, J. F. (1955). Diagnóstico de la esterilidad en el macho. Técnica de la punción testicular. **[Testicular biopsy in diagnosis of sterility.]**—*Rev. Med. vet., B. Aires.* **37,** 1-6 & 9-17. **3979**

Testicular biopsy in rams and bulls was carried out, under local anaesthesia, by means of a trocar and cannula.—M.G.G.

Hulet, C. V., Voigtlander, H. P., Jr., Pope, A. L. & Casida, L. E. (1956). **The nature of early-season infertility in sheep.**—*J. Anim. Sci.* **15,** 607-616. **3980**

Breeding records were analysed over 7 years for one Hampshire and one Shropshire flock; overall fertility was better when breeding began in September than a month earlier, and continued to improve, each season, up to October. The early season infertility seemed to be due almost entirely to early foetal death.

—F. L. M. Dawson.

Holz, K. (1956). Über angeborene Missbildungen des Zentralnervensystems und ihre Bedeutung für die Infektionskrankheiten des Schweines. **[Congenital malformations of the central nervous system and their significance for infectious diseases of pigs.]**—*Dtsch. tierärztl. Wschr.* **63,** 260-263. **3981**

Congenital malformations of the brain or spinal cord in 32 pigs were described. In these animals swine erysipelas was found 5 times, swine fever 4 times, generalized diplococcal or streptococcal infection 4 times, purulent encephalitis twice, swine influenza twice, and acute gastro-enteritis twice.—M.G.G.

Jørgensen, S. K. (1956). Medfødt kronisk porfyri hos svin. **[Congenital chronic porphyria in swine.]**—*Nord. VetMed.* **8,** 562-580. [In Danish. English and German summaries. English summary modified.] **3982**

A report of congenital porphyria in pigs in Denmark. All cases were traced back to a single boar. The disease depends on the presence of one or more dominant genes as opposed to porphyria in cattle which is caused by recessive genes. The most prominent signs were discoloration of the teeth and bones and excretion of pathological porphyrins in the urine and faeces. General condition was affected only in a few serious cases. Photosensitization was not observed. The gross, histological and biochemical pathology is described, and present day knowledge of porphyrins and disturbances in the porphyrin metabolism is discussed briefly.

Glenister, T. W. (1956). **Determination of sex in early human embryos.**—*Nature, Lond.* **177,** 1135-1136. **3983**

Sex chromatin was distinguishable in cells of various tissues of female human embryos. It was also present in 6 out of 13 embryos which had not reached the stage of differentiation of the gonads into ovary or testicle. [See also *V.B.* **26,** 2458.]—R.M.

Anon. (1956). **Genetic effects of atomic radiation.**— *Science.* **123,** 1157-1164. **3984**

The Committee on Genetic Effects of Atomic Radiation came to these conclusions: any dose of radiation, however small, can induce mutation; practically all mutations induced by radiation are harmful; repeated doses are cumulative and will produce more, but not worse, mutations. They recommended: (1) the history of exposure to radiation of each individual should be recorded, (2) people should be exposed to X-rays as little as possible; above all the gonads must be protected, (3) members of the public should receive not more than 10 r. up to the age of 30 from artificial sources of radiation, (4) this figure of 10 r. should be reconsidered periodically with a view to reducing it

(5) individual persons should receive not more than 50 r. up to 30 years of age and not more than 50 additional r. up to the age of 40, (6) work involving high doses of radiation should be given only to those unlikely to have children subsequently.—M.G.G.

See also abstr. **3696** (E. monocytogenes as cause of caprine abortion); **3711-3720** (brucellosis); **3721** (experimental leptospirosis in pregnant sows); **3727-3731** (V. fetus infection); **3745** (foetal infection with PPLO following infection of the dam); **3754-4757** (trichomoniasis); **3792-3793** (ovine virus abortion); **4010** (development of Xenopus laevis).

ZOOTECHNY

CARRIE, M. S., MOORE, J. B. & CHISHOLM, J. S. (1956). **The depilation of sheep skins with acetic acid.**—*N.Z. J. Sci. Tech. Sect. B.* **38,** 19-30. [Authors' summary modified.] **3985**

The use of mucolytic enzymes for the loosening of wool from sheep skins was studied, but the method is unlikely to be of any value on a commercial scale under New Zealand conditions. Acetic acid and acetate buffers had a very marked loosening effect on the wool. The wool on skins soaked for 16 hours in M/20 acetate buffer at pH 4 and at 35°C. was loosened sufficiently for commercial "pulling," although for reasons not elucidated it was still tightly held in some isolated patches. Similar results were obtained by soaking for a short period in M/1 acetic acid, wringing free from excess acid, and incubating for 16 hours at 32°C. The wool and pelts were both initially in very good condition. Other acids tested, and ammonia, and ammonia + lime, were less effective than acetic acid.

ROBERTSON, A. (1956). **Blood-grouping in dairy cattle improvement.**—*Proc. VIIth Int. Congr. Zootech., Madrid.* Part 2. pp. 79-86. [In English. French, German and Spanish summaries. Author's summary modified.] **3986**

The main use at present made of blood-typing in cattle breeding is in the checking of pedigree information. R. discussed the possibilities of more direct application to cattle improvement. Two distinct genetic phenomena are concerned in this, linkage and pleiotropy. It is considered that the phenomenon of linkage cannot be utilized at all in improvement. On the other hand, pleiotropy, the action of the same gene on blood antigens and on production characteristics, may be of some value but has not yet been shown conclusively to exist. It is more likely to be found in useful form in unimproved breeds in which genes for high production may be at lower frequencies than in improved breeds in which such genes should have been selected to high frequencies.

Blood-typing can also give valuable information on the process of breed formation. Breeds which have been passed through a breeding "bottle-neck" have a small number of segregating alleles in the B system. This is particularly noticeable in Shorthorns, which have two alleles at high frequency and, to a lesser extent, in the Red Danish Dairy breed and in Herefords in the U.S.A. Holstein-Friesians, on the other hand, have a much larger number of alleles and presumably have never gone through a process of inbreeding. Blood-typing also gives interesting evidence on the historical interrelationships between different breeds.

EMMERSEN, M. A. & HAZEL, L. N. (1956). **Radiographic demonstration of dwarf gene-carrier beef animals.**—*J. Amer. vet. med. Ass.* **128,** 381-390. **3987**

Radiography of the spine of a calf with the dwarf gene will reveal undulations on the ventral profile of the last 4 or 5 thoracic and all of the lumbar vertebrae. These are thought to indicate longitudinal compression during the cartilaginous stage of development. Another characteristic feature is the bending forwards of the transverse processes.—M.G.G.

LAMBOURNE, L. J. (1956). **Artificially-induced lactation in ewes.** — *Vet. Rec.* **68,** 498-500. **3988**

Thirteen 5 and 6-year-old Romney ewes received a single s/c injection of between 5 and 80 mg. of stilboestrol in oil, and two, which received 40 mg., were given a second similar dose 14 days later. The udders and teats were massaged twice daily and lambs sucked from the 5th day after injection. Milk yield varied greatly betwen individuals. No ewe attained more than a third of normal production.—M.G.G.

SAINSBURY, D. W. B. & SCORGIE, N. J. (1956). **Studies on the climate of pig houses. II. Air temperature and humidity in piggeries.**—*Brit. vet. J.* **112,** 357-365. **3989**

In cold weather the temp. in well insulated piggeries with controllable ventilators was 20° to 35° F. above that outside, but in badly designed piggeries the difference was only 2° to 8° F. The badly designed piggeries were also damp, with condensation on the roof and walls. —M.G.G.

GILL, J. C. & THOMSON, W. (1956). **Effect of environmental temperature on suckling pigs and a study of the milk yield of the sow.**—*J. agric. Sci.* **47**, 324-331. **3990**

Piglets kept at an average temp. of 44°F. used their food less efficiently and ate more meal before weaning than piglets kept at about 62°F. There was no significant difference in the amount of milk consumed nor in weaning weight. The average milk yield of 6 sows from the 3rd to the 56th day of lactation was 275 kg. It was estimated that they required 412 calories to produce 1 lb. of milk. Liver disease developed in some piglets and was associated with low consumption of meal before weaning.—M.G.G.

VÖHRINGER, K. (1956). Tierpsychologie in der täglichen Praxis. **[Animal psychology in daily practice.]** — *Ber. Münch. tierärztl. Wschr.* **69**, 170-173. **3991**

The author described the procedures for restraining horses, dogs, cattle, pigs and sheep for treatment. It is important that they be given no opportunity of becoming excited or of learning how to resist.—M.G.G.

See also abst. **3926** (husbandry and diseases of pigs).

TECHNIQUE AND APPARATUS

PREER, J. R., JR. (1956). **A quantitative study of a technique of double diffusion in agar.**—*J. Immunol.* **77**, 52-60. [Author's summary modified.] **3992**

Warm agar is poured over serum in tubes and, after the agar has cooled and solidified, antigen is added. Tubes approx. 1·7 mm. inside diam. are used, making it possible to use quantities as small as 0·01 ml. Egg albumen in concentrations as low as approx. 0·0001% was detected in this way. A theoretical treatment of double diffusion is given which predicts the relation between band position, antigen and antibody concentration, antigen and antibody diffusion coefficients, time, and agar length. Experimental results agreed with these predictions in most respects. Zones of precipitation, however, failed to move as rapidly as predicted. In particular, it was shown that band position is linearly related to the logarithm of the ratio of the antigen to antibody concentrations. Bovine gamma globulin and azo-substituted bovine gamma globulin were used to show the interaction between immunologically related proteins. Non-specific effects and the identification of bands were considered.

BEST, C., FORDHAM, S., HALLPIKE, C. S., RIDDIHOUGH, M., SCHUSTER, E. H. J. & SEARS, J. E. (1956). **Notes on the technique of temporal bone microtomy.** — *Brit. med. Bull.* **12**, 93-100. **3993**

A detailed account of microtomy technique and the use of nitrocellulose as an embedding agent.—R.M.

ANON. (1956). **"Xeroradiography—blackboard X-ray."**—*Vet. Med.* **51**, 243-244. **3994**

Instead of using photographic film, X-rays are projected on to a dry selenium-coated aluminium plate, electrostatically charged. The image can be developed by dusting the plate with a powder. This process takes 40 sec. After wiping off the powder, the plate is ready for use again. The method is not yet available commercially.—R.M.

BROLIN, S. E., CARSTENSEN, H. & HELLMAN, B. (1956). **Remarks on the performance and control of hypophysectomy in the rat.**—*Acta endocr., Copenhagen.* **22**, 68-72. [In English.] **3995**

A discussion on the technique of hypophysectomy, and on histological examination to assess the results of the operation.—R.M.

COLLERY, L. (1956). **Technique in radioassay.**—*Irish vet. J.* **10**, 150-155. [Author's summary modified.] **3996**

Organs of rabbits and pigs receiving radioactive sulphur and phosphorus were examined for radioactivity by several methods. Fresh organs, organs dried by heat and organs disintegrated by hot nitric acid were assayed. Those disintegrated by nitric acid gave the highest count per unit volume. Methods used in the preparation of animals and organs and for assay are described, and some of the factors involved are discussed.

See also abstr. **3682** (diagnosis of bovine-type tubercle bacilli by slide culture); **3725** (large-scale production of tetanus toxin); **3734** (electron-microscopy of bacteria); **3765** (preservation of Toxoplasma by freezing); **3782** (biological tests in E.I.A.); **3917** (acetone test); **3952** (haemoglobin determination in dogs and goats); **3965-3966** (electron-microscopy of spermatozoa); **3977-3979** (testicular biopsy).

REPORTS

GREAT BRITAIN. (1956). **National Institute for Research in Dairying, University of Reading, report 1955.** pp. 152. Shinfield: The Institute. 4s. **3997**

There are eight research departments. Those of Dairy Husbandry, Feeding and Metabolism, and Physiology deal with problems, both immediate and fundamental, associated with the technique and scientific background of milk production. The other five, Bacteriology, Chemistry, Physics, Engineering and Nutrition deal with the application of science both to farm production and to the industrial side of dairying. Other sections are Isotopes, Statistics and Psychology.

The dairy herd consisted of 461 cattle and all underwent the tuberculin test without any reactors. Vaccination of calves against CONTAGIOUS ABORTION at 4–6 months of age has been continued and there has been no case of the disease. Clinical symptoms of MASTITIS are recorded by the cowshed staff and antibiotic treatment is given when required. Forty per cent. of the cows in milk showed clinical manifestations and of the dry cows 27·7% had staphylococcal infections and 21·5% "green streptococci" infection. Throughout the year, 68 calves which died were sent to the Royal Veterinary College for *post mortem* examination. The Department has continued typing strains of *Bacterium coli* associated with the deaths of these calves.

The total number of pigs in the Institute was 431 and it was intended to increase the number of sows and gilts kept to 55 or 60. All pigs are vaccinated against SWINE FEVER and SWINE ERYSIPELAS. The herd is free from virus pneumonia. Numerous feeding experiments are carried out.

The report ends with a list of 151 publications by members of the staff between October 1954 and September 1955.—D. S. RABAGLIATI.

NORTHERN RHODESIA. (1956). **Department of Veterinary Services Annual Report for the year 1955.** [SWAN, J. F. C.] pp. 19. Lusaka: Government Printer. 1s. 6d. **3998**

Climatically the year was favourable. The cattle population, after a setback in 1954, increased and now is in excess of one million, an increase of 300,000 head since 1945.

FOOT AND MOUTH DISEASE occurred in the Kalomo district but was soon checked and only one secondary focus occurred. The incidence of STREPTOTHRICOSIS was less. RABIES increased, there being three times as many positive cases submitted to the Laboratory as in 1954. 16,000 doses of vaccine were issued, and charges for vaccination were waived.

An outbreak of TRYPANOSOMIASIS in cattle caused 400 deaths. Infection was attributed to mechanical transmission.

NEWCASTLE DISEASE was recorded and there were 21 outbreaks of AVIAN LEUCOSIS. In two outbreaks of turkey MALARIA dosing with ten grains of quinine hydrochloride on three successive days stopped the mortality.

Routine laboratory diagnosis was carried out and many thousands of specimens were examined. The veterinary staff in the Department consisted of 22 with 160 assistants. Close liaison is maintained between the pasture research officers and the veterinary services.

—D. S. RABAGLIATI.

MAURITIUS. (1956). **Annual Report of the Department of Agriculture for the year 1954.** pp. 97. Port Louis, Mauritius: J. Eliel Felix, Govt. Printer. [Contains the report of the Senior Veterinary Officer (DARNÉ, A.) pp. 70-72.] **3999**

The veterinary officers continued routine inspection of slaughter houses; provided instruction in meat inspection for sanitary inspectors; were responsible for the supervision of the quarantine kennels; and for the enforcement of the diseases of animals ordinances.

A campaign against TUBERCULOSIS was carried out and the tuberculin test revealed 14% reactors in 1,483 animals tested and 28 reactors out of 257 dairy cows. NEWCASTLE DISEASE caused heavy losses; 125,000 doses of vaccine were used with good results. FOWL POX vaccination is still done on a large scale with almost 100% protection.

The main deficiency diseases were HYPOCALCAEMIA and VITAMIN D DEFICIENCY.

Over 7,000 cows were artificially inseminated with good conception results.

—D. S. RABAGLIATI.

BOOK REVIEWS

CAMERON, T. W. M. [Professor of Parasitology, McGill University and Director, Institute of Parasitology, Macdonald College, Canada.] (1956). **Parasites and parasitism.** pp. xiii+322. London: Methuen & Co. Ltd. 35s. (New York: John Wiley & Sons, Inc.) **4000**

In this book the author treats parasitism as a natural biological phenomenon. The greater part of the book is taken up with a general account of the parasites themselves, a large number of representative types being discussed. The rest of the book deals with the interesting subject of host-parasite relationships. The phenomenon of parasitism is discussed, as well as the natural history of parasitic disease, the geographical and climatic factors which control the distribution of parasites, the control of parasites, and parasite disease, and finally the evolution of parasites. The author also shows how comparative parasitology can be used to assess the evolutionary relationships between different groups of animals. There is a useful bibliography which will assist those who wish to follow details of the subject more deeply.

The book is written for the zoologist and is not intended as a text-book of Veterinary or Medical parasitology. The busy practitioner can, therefore, expect to find very little in the book which will assist him in the control of parasitic disease but the veterinarian, who has a general interest in parasitology will find much of interest in its pages.—T. E. GIBSON.

FERRANDO, R. [Professeur à l'Ecole Nationale Vétérinaire d'Alfort.] (1956) . Précis d'alimentation du poulet. **[The nutrition of the fowl.]** pp. 96. Paris: Vigot Frères. **4001**

This book is essentially an outline of the practical feeding of poultry and is written for the French poultry keeper and veterinarian.

Briefly but concisely it describes:— the anatomy and physiology of the digestive system; the nutritional requirements of the chick, growing chicken, and laying hen, and the effect of deficiency; rations for growth and production; and the use of hormones, antibiotics, and detergents.—F. T. W. JORDAN.

BODDIE, G. F. [William Dick Professor of Veterinary Medicine, Edinburgh University (Royal Dick School of Veterinary Studies.)] (1956). **Diagnostic methods in veterinary medicine.** pp. xi + 412. Edinburgh (and London): Oliver & Boyd. 4th Edit. 25s. **4002**

The previous edition was published in 1950 [see *V.B.* **21**, 905]. The new (fourth) edition has numerous minor additions or amendments; for example, revision of the chapters on clinical haematology and poultry diseases, and the inclusion of information on hyperkeratosis in cattle; porcine atrophic rhinitis; "fog fever" in cattle; and complement-fixation tests for Johne's disease, foot and mouth disease, and canine virus hepatitis. There is no mention of diagnostic methods for *Trichomonas foetus* or *Vibrio fetus* infections, examination of cerebrospinal fluid, or biopsy of liver and bone marrow. The quality of the paper is better.—R.M.

BOL', K. G. & BOL', B. K. (1954). Základy patologickej anatomie domácich zvierat. **[Elements of veterinary pathology.]** pp. 683. Bratislava: Slovenská Akadémia Vied. Kčs 139. [In Slovak.] **4003**

This text-book for veterinary students was translated into Slovak from the Russian original, first published in 1948. It contains a general and a special section. The general part consists of chapters on death of the organism and of tissues, metabolic disorders, tumours, circulatory and lymphatic disturbances, inflammation, developmental disturbances, abnormal positions of organs and stenosis and dilatation of tubular organs. The special section deals with the pathology of non-infectious processes and infectious diseases. There are 377 illustrations, some of which are in colour.—E.G.

SIŇOV, A. V. (1955). Klinická diagnostika vnútorných chorôb domácich zvierat. **[Clinical diagnosis of internal diseases in domestic animals.]** pp. 379. Bratislava: Slovenska Akadémia Vied. Kčs 72,70. [In Slovak.] **4004**

This is a Slovak translation of the second, revised edition of a Russian text-book published in 1946. The chapters deal with general principles of diagnosis, examination of the animal, examination of the respiratory, circulatory, digestive, urogenital and nervous systems, gastric secretions, exudates and transudates, and blood. There is a list of literature, mostly of text-books. The great majority of the works listed is by Russian authors and of the 1926–37 period. The three most recent references are to works by Russian authors published in 1940. —E.G.

MANNINGER, R. & MÓCSY, J. (1954). Liečenie vnútorných chorôb pre veterinárov a pre poslucháčov veterinárnej medicíny. I. Diel. Nákazlivé choroby. II. Diel. Choroby orgánov. **[Treatment of internal diseases**

for veterinary practitioners and students. Vol. I. Infectious diseases. Vol. II. Diseases of organs.] pp. 541 and 622. Bratislava: Slovenská Akadémia Vied. Kčs 55. and Kčs 71. [In Slovak.] **4005**

This Slovak translation of the original Hungarian text-book, which was first published in 1951, consists of two volumes, dealing with infectious diseases and diseases of organs, respectively. Volume I is divided into sections on diseases caused by bacteria, viruses, spirochaetes (including leptospiroses) and protozoa. The chapter on bovine trichomoniasis has, however, been included among bacterial diseases, following brucellosis. *Vibrio fetus* infection in cattle is discussed in barely 5 lines of a short paragraph on "other causes" of abortion, which is surprising, even when it is taken into account that the work was originally published in 1951. Bovine mastitis has been omitted altogether. Part II deals with diseases of the various organ systems, including parasitic infestations. Illustrations in both volumes total 212, some of which have been taken from Hutyra & Marek's well-known "Special Pathology and Therapy of Domestic Animals." There is a subject index in each volume, but no bibliography. Paper, print and binding are good.—E.G.

Gardner, C. A. & Bennetts, H. W. (1956). **The toxic plants of Western Australia.** pp. xxlx+253. Perth: Western Australian Newspapers Ltd. 50s. **4006**

It is difficult to imagine a partnership more suited to the production of a book on poisonous plants than that provided by a field botanist and a veterinary pathologist; especially when, as in this case, the authors have collaborated for many years in original research on the subject. The result of their efforts fully comes up to one's expectations, and sets a new high standard for books of this kind. It can be compared favourably with even such a classic as Steyn's "Toxicology of the plants of South Africa."

After dealing in their introduction with plant poisons in general, and with poisoning due to cyanogenetic plants and to plants causing photosensitization, the authors proceed to consider the local poisonous plants by families, giving in each case a description of the plant, followed by an account of its toxicity, the symptoms it produces, and the *post mortem* findings encountered. All this is described in simple language, the use of technical terms being kept to a minimum. In many cases interesting information is given on the history of the plant. There are numerous references both to Australian and world literature. Appendices give details of geographical distribution and provide tables relating symptoms with the plants that cause them. The book is admirably illustrated with line drawings by C. A. Gardner, and with excellent water-colour drawings by C. A. Gardner and Edgar Dell.

There is very little in this work that one can criticize. It is perhaps surprising to find no mention of treatment, even of first aid measures, but perhaps this is because such action is impracticable under Australian conditions. The authors do not tell one much about the toxic principles of the various plants, and what information they do given is sometimes misleading; oxalic acid, for example, can hardly be called a mineral poison. But this in no way detracts from the value of a book that should be of real service to both stock owners and toxicologists.
—E. G. C. Clarke.

Musselman, M. M. [Professor of Surgery, University of Nebraska College of Medicine.] (1956). **Terramycin (Oxytetracycline).** pp. 144. New York: Medical Encyclopedia, Inc. $4.00. [Antibiotics Monographs No. 6.] **4007**

This monograph reviews nearly 700 articles, mainly on the pharmacology and medical applications of oxytetracycline, published since its discovery in 1949. Individual chapters described the principles of therapy, combined therapy with A.C.T.H., resistance of organisms and reactions of the body, and the treatment of infections of each of the body systems in human beings. This is the sixth of a very useful series of monographs on antibiotics: nine others are being prepared [see also *V.B.* **26,** 2760].—R.M.

Luck, J. M., Allen, F. W. & Mackinney, G. [Edited by.] (1956). **Annual review of biochemistry. Vol. 25.** pp. ix+794. California: Annual Reviews, Inc. $7.50. **4008**

There has been no change in the presentation or high quality of this twenty-fifth volume reviewing the progress of Biochemistry.

There is a prefatory chapter paying tribute to the late Sir Edward Mellanby, and giving an enjoyable account of a fascinating period in the development of nutritional Biochemistry to which he contributed in no small measure. The book is a useful "aide-mémoire" to the busy veterinary research worker who has little time to cover the ever-increasing number of biochemical papers.—D. S. Papworth.

—. (1956). **Advances in biological and medical physics. Vol. IV.** [Edited by Lawrence,

J. H. & TOBIAS, C. A.] pp. x+356. New York: Academic Press Inc. $8.80. **4009**

The subjects dealt with in this volume are:—X-ray diffraction applied to crystalline proteins; the problem of transfer of "information" on chemical structure from the nucleic acids to proteins; the biophysical and biochemical study of cell division; lethal effects of high and low temperatures on unicellular organisms; infra-red spectrometry; kinetics of iron metabolism (in human beings); the gross composition of the body; a discussion of ageing processes, disease and life expectancy.—R.M.

—. (1956). **Normal table of *Xenopus laevis* (Daudin). A systematical and chronological survey of the development from the fertilized egg till the end of metamorphosis.** [Edited by NIEUWKOOP, P. D. & FABER, J.] pp. 243. Amsterdam: North-Holland Publishing Company. Guilders 22,75. **4010**

The contributors to this book were a team of about 20 scientists of various nationalities. The development of *X. laevis* is set out in a continuous, readable form, the different body systems being described in turn. Subsidiary chapters deal with the classification and distribution of the genus *Xenopus*, the rearing of *X. laevis* in captivity, the criteria of the 66 developmental stages and a comparison of the various normal tables of Anuran development. There is an index and a bibliography of 45 pages. The book concludes with some excellent plates illustrating each stage of development.

—M.G.G.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

TILLMAN, H. (1956). Die Schwangerschaftsdiagnose beim Rind. **[Pregnancy diagnosis in cattle.]** pp. 107. Berlin (& Hamburg): Paul Parey. 5th Edit. DM 9.60.

—. (1956). **Diseases of cattle.** [Edited by: FINCHER, M. G., GIBBONS, W. J., MAYER, K. & PARK, S. E.] pp. xvii+752. Illinois: American Veterinary Publications, Inc. $16.50.

—. (1956). **Nerve impulse. Transactions of the Fifth Conference, September 20, 21 and 22, 1954.** [Sponsored by the Josiah Macy, Jr. Foundation.] [Edited by NACHMANSOHN, D. & MERRIT, H. H.] pp. 256. New York: Josiah Macy, Jr. Foundation. $4.50.

—. (1956). **Group processes. Transactions of the Second Conference, October 9, 10, 11 and 12, 1955, Princeton, N.J.** [Sponsored by the Josiah Macy, Jr. Foundation.] [Edited by SCHAFFNER, B.] pp. 255. New York: Josiah Macy, Jr. Foundation. $3.50.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.

NUTRITION ABSTRACTS AND REVIEWS

A quarterly journal which covers the fields of human and animal nutrition. It includes everything from analytical, clinical and experimental techniques to immunology and therapeutic diet.

Special attention is given to the relations of diet to health. In the animal section a subsection is devoted to diseases due to dietary deficiency, for instance deficiency of trace elements in pasture; disorders of metabolism such as grass tetany; and the effect of diet on resistance to infections and toxins.

A review article appears in each quarterly issue. Recent articles of particular interest to animal health are: The Fluorine Problem in Livestock Feeding; Vitamin E in the Nutrition of Farm Animals; Nutrition and Host-Helminth Relationships; The Nutrition of the Horse.

The current volume is Volume 26 (Jan., April, July, Oct., 1956). Price 105s. (U.S.A. $15.75.)

Back numbers of certain volumes are still available. Subscriptions should be sent to The Secretary, Nutrition Abstracts and Reviews, Rowett Research Institute, Bucksburn, Aberdeenshire, Scotland.

NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY, SYDNEY, AUSTRALIA

VACANCY FOR SENIOR LECTURER/LECTURER IN ANIMAL NUTRITION OR ANIMAL PHYSIOLOGY, SCHOOL OF WOOL TECHNOLOGY

Salary: Senior Lecturer ... £A1,852 range £A2,202 per annum.
Lecturer ..... £A1,252 range £A1,802 per annum.

Commencing salary according to qualifications and experience.

Applicants must possess an appropriate degree, diploma or equivalent qualifications and should preferably have had some post-graduate experience in research or industry. For appointment as Senior Lecturer a higher degree or evidence of research achievement is essential.

Duties of the successful applicant will include teaching and laboratory work and he will be expected to participate in the School's research programme and extension work in the industry.

Appointee will be eligible, subject to passing a medical examination, to contribute to the New South Wales Superannuation Fund.

First-class shipping fares to Sydney of appointee and family will be paid.

Further particulars may be obtained from Professor P. McMahon, Head of the School of Wool Technology.

Five copies of applications (including the names of two referees) should be lodged with the Agent General for New South Wales, 56 Strand, London, W.C.2., and one copy forwarded by airmail to the Bursar, N.S.W. University of Technology, in an envelope marked "University Appointment," to Box 1, Post Office, Kensington, New South Wales, Australia, not later than the 14th December, 1956.

When an animal is but a shadow of itself...

the cause may well be 'deficiency' trouble leading to anæmia and scour.

"OXOID" Vitaminised Liver Extract (Veterinary) marks a remarkable advance in the treatment of deficiency diseases. Designed specifically for use by the Veterinary profession, "OXOID" Vitaminised Liver Extract (Veterinary) is a 'crude' liver extract containing naturally occurring factors of the Vitamin B complex fortified with synthetic vitamins. Potency and freedom from toxic substances are determined clinically before issue. Tests conducted by well-known Veterinary Surgeons confirm that it marks a remarkable advance in the treatment of deficiency diseases.

FORMULA:
Each ml. of Liver Extract is fortified with

Vitamin B1	50 mg
Vitamin B2	1 mg
Nicotinamide	75 mg
Vitamin B6	2.5 mg
Calcium Pantothenate	2.5 mg
Vitamin B12	15 mcg

Literature upon request.

OXOID **VITAMINISED LIVER EXTRACT (VETERINARY)**
for the prevention and relief of anæmia and scour

OXO LTD. (VETERINARY DEPT.) THAMES HOUSE, LONDON, E.C.4 Tel: CENtral 9781

LABORATORY SUPERINTENDENT required by NIGERIA NORTHERN REGION Veterinary Department for tour of 12–24 months in first instance. Salary scale (including Inducement Addition) £810 rising to £1194 a year. Commencing salary according to experience. Gratuity at rate £100/£150 a year. Clothing allowance £45. Free passages for officer and wife. Assistance towards children's passages and maintenance grant up to £288 annually. Liberal leave on full salary. Candidates should be A.I.M.L.T. Experience in a veterinary laboratory an advantage. Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3/43765/VC.

THE VETERINARY BULLETIN

Published monthly on the 1st of the month, 12 issues per volume. A combined Author and Subject Index is issued for each volume. Price 7s. 6d. net per issue. Annual subscription 60s. net.

All publications of Commonwealth Agricultural Bureaux are obtainable from:—
CENTRAL SALES BRANCH (COMMONWEALTH AGRICULTURAL BUREAUX)
FARNHAM ROYAL, NR. SLOUGH, BUCKS, ENGLAND

Subscribers resident in the British Commonwealth, the Republic of the Sudan or the Republic of Ireland obtain a 20 per cent. discount on the annual subscription on orders sent direct to the Central Sales Branch, thus making the subscription 48s. net.

Printed in Great Britain by CHARLES BURRELL & SON. Chertsey, Surrey.

AUTHOR INDEX

(The numbers refer to abstracts and not to pages. Where a page number appears after an author's name it refers to an entry in the list of books received)

Abakumov, G. V., 3552.
Abbott, U. K., 3907.
Abdou, A. H., 3850.
Abe, H., 553.
Abdussalem, M., 151.
Abell, T., 3302.
Abelson, P. H., 2756, page 360.
Aberg, E., 173. 1693.
Abishev, A., 616.
Abramov, I. V., 1593.
Abramova, S. M., 2675.
Abreu Lopes, J. A., 3161.
Abshagen, H., 1212.
Achtzehn, W., 1619.
Adair, J., 2961.
Adams, C. E., 1029, 1437, 3030.
Adams, E. V., 3771.
Adams, J. L., 2448.
Adams, J. M., 446.
Adams, K. M., 3184.
Adams, R. D., 141.
Adamson, J., 1473.
Adamsons, K., Jr., 2431.
Adamstone, F. B., 1708.
Adler, H. C., 3024.
Adler, H. E., 131, 1206, 2565, 2835, 3424, 3425, 3746.
Adler, H. J., 1787.
Adler, J. H., 1367, 2047, 3915.
Adler, M. V., 2213.
Aehnelt, E., 1140, 1515.
Afonski, S. I., 3328.
Afonsky, D., 259.
Agresti, A., 1778.
Agrimi, P., 1579.
Ahmad, F. G., 514.
Ahmed, H. N., 1982.
Ahrens, R. H., 2836.
Ahos, E. O., 2101.
Ainsworth, G. C., 63, 1474, 3736.
Airapetyan, V. G., 2297.
Aitken, J. R., 3637.
Aitken, R. N. C., 1420.
Akçay, S., 2687.
Akkermans, J. P. W. M., 2545.
Akman, S., 2399.
Akopyan, E. S., 1099.
Akramovski, M. N., 3531.
Aktan, M., 2598.
Akün, R., 80.
Akulov, A. V., 2487.
Akulova, M. F., 1532.
Alashkin, A. Y., 1240.
Albericci, J. P., 3359.
Albertini, A. V., 2167.
Alberts, J. O., 1779, 1984.
Aleksić, F., 2903.
Aleraj, Z., 2875, 2877.
Alessandro, A., 2521.
Alexander, A. D., 2211.
Alexander, D. P., 914, 915.
Alexander, F., 1798, 2089.
Alexander, R. A., 3330.
Alford, H. I., Jr., 2804.
Alford, J. A., 1486.
Alikaev, V. A., 1380.
Alix, D., 17, 1121.
Allcroft, R., 892.
Allen, C. J., 2736.
Allen, F. W., 4008, page 602.
Allen, H. C., Jr., 248.
Allen, P. H., 2961.
Allen, R. W., 893.
Allen, S. H., 3237.
Allen, V., 1169.
Allison, J. B., 2652.
Allison, R. M., 2121.
Allred, J., 3592.
Almasy, F., 197.
Alosi, C., 2157.
Alpert, S., 142.
Alson, M. C., 357, 2182.
Alterauge, W., 2261.
Altieri, M., 48.
Alton, G., 3113.
Alton, G. G., 44, 2535, 2536, 3395.
Altschul, A. M., 899.
Altschule, M. D., 1843.
Amandin, (Frère)., 1350.
Amarasinghe, A., 751.
Ambrosino, C., 2870, 2871, 2873.
Amerault, T. E., 1157.
Ames, S. R., 3236.
Amfiteatrov, F. Z., 2982.
Amitrov, V. K., 2591.
Ammerman, C. B., 1696.
D'Amore, A., 2908.
Amoroso, E. C., 2122.
Amstutz, H. E., 1918.
Anantaraman, M., 509.
Ancill, R. J., 3284.
Andersen, A. C., 222.
Andersen, H., 1452.
Andersen, M. E., 1506, 3683.
Anderson, A. C., 2138.
Anderson, B. M., 1360.
Anderson, C. M., 2423.
Anderson, E., 2841.
Anderson, G. W., 2665, 3733.
Anderson, J. P., 2366.
Anderson, J. R., 3883.
Anderson, J. W., 257.
Anderson, R. A., 640.
Anderson, R. L., 2106.
Anderson, W. A., 2351.
Andersson, B., 1003, 2304.
Andersson, G., 1633.
Ando, K., 2270.
Andral, L., 444.
Andrašić, N., 2435.
André, T., 2061.
Andreev, E. V., 3477, 3478.
Andres, J., 288.
Andrewes, C. H., 1237.
Andrews, E. D., 542, 2366, 2411.
Andrews, F. N., 2361, 2956.
Andrews, R. D., 914.
de Angelis, R. C., 1726.
Angeloff, S., 1289.
Anger, D., 3363.
Angulo, J. J., 475.
Annau, E., 137.
Anthony, D. J., 1075.
Anthony, H. D., 3436.
Antipin, D. N., 894, 2950.
Anton, O., 955.
Antonyan, A. G., 2249.
Anusz, Z., 719.
Apollosov, K. A., 1532.
Apparecida Pontes, M., 1726.
Appell, R. N., 3412.
Appleby, E. C., 19.
Appleby, J. C., 414.
Aragona, J., 83.
Aramburu, H. G., 83, 812, 3146, 3445.
Arata, D., 3556.
Araújo-Branco, A., 84.
Archer, R. K., 551, 552.
Archibald, J., 3329, 3956.
Arend, I., 3605.
Arendarčík, J., 3017.
Arias-Stella, J., 1447, 1448.
Armour, J., 2438.
Armstrong, D. G., 3883.
Armstrong, W. H., 2190.
Arnesen, K., 3870.
Arnold, J. H. S., 923.
Arnold, M. W., 2056.
Arnold, R. M., 3889.
Arnott, W. M., 573.
Aroldi, E., 1781.
Arroyo y Martin, C., 1340.
Arthur, D., 1721.
Arthur, G. H., 3011.
Asami, N., 2490.
Asboe-Hansen, G., 1079.
Aschkenasy, A., 3555.
Asdell, S. A., 1845, page 177.
Ash, R. W., 2089.
Ashenbrucker, H., 2038, 2968.
Ashton, G. C., 1710, 2072.
Aslanyan, M. M., 2114.
Asling, C. W., 1727.
Aspinall, K. W., 2149.
Asplin, F. D., 1125, 3502, 3689.
Astill, K. J., 1440.
Atanasiu, I., 119.
Atanasiu, P., 119, 1645, 3775.
Athens, J. W., 2068.
Atkeson, F. W., 981.
Atkinson, J. W., 3022.
Atkinson, R. L., 526.
Atkinson, W. B., 3544.
Attar, T., 1816.
Attfield, M., 2126.
Attleberger, M. H., 2184.
Atzori, E., 1807.
Audi, S., 2774, 2875, 2877.
Auerbach, S., 337.
Aulisio, C. G., 2584.
Aull, J. C., 864.
Austin, C. R., 282, 1438, 3640.
Austwick, P. K. C., 3736.
Autio, E. O., 2101.
Avellini, G., 14.
Averill, R. L. W., 1437.
Axelrod, A. E., 489.
Aygün, S. T., 3455.
Aynsley, L. H., 2.
Azuma, R., 1113, 2174.

Babintsev, G. F., 2376.
Babos, A., 1929.
Babudieri, B., 2908.
Bachmann, R., 2810.
Bachrach, H. L., 1943, 2265, 2590.
Baddeley, R. M., 3280.
Badhwar, R. L., 326.
Badiali, C., 2623.
Badreldin, A. L., 2098.
Bahmanyar, M., 3775.
Bahr, L., 1514.
Baier, W., 362, 1138.
Bailey, C. B., 2419, 2420.
Bailey, G. L., 3343.
Bailey, W. S., 913.
Bain, A. M., 400.
Bain, R. V. S., 356, 731, 1518, 2507.
Baird, C. D. C., 2371.
Bajocchi, E., 3116.
Baker, F. N., 619.
Baker, L. N., 294.
Bakhtin, A. G., 3407.
Bakker, S., 2881.
Bakos, K., 360, 3169.
Balasubramanian, A., 820.
Balazs, E. A., 271.
Balbierz, H. C., 3233.
Baldelli, B., 2476.
Balducci, D., 3144.
Bálintffy, I., 1400.
Ballarini, G., 2231.
Ballot, H., 2666.
Balloun, S. L., 189, 193.
Balmain, J. H., 525, 3290.
Balows, A., 3738.
Balozet, L., 77.
de Balsac, H. H., 3053, page 360.
Baltazard, M., 3775.
Bamberger, K., 2900.
Bang, F. B., 476, 1237, 1606.
Bangham, A. D., 623.
Banik, U. K., 1790.
Bankowski, R. A., 128, 3162, 3817, 3920.
Banks, W. C., 3864.
Bannatyne, C. C., 1190.
Bannister, G. L., 3177.
Baranowski, C., 82.
Barber, C. W., 32, 1589, 2794.
Barber, R. S., 198, 458, 1705.
Barbieri, M., 16.
Barbiers, A. R., 3266.
Barboni, E., 1601.
Bărbulescu, M., 1588.
Bard, R. C., 1560.
Barker, C. A. V., 2742.
Barker, J. S. F., 3321.
Barlow, A. J. E., 64, 1908.
Barnard, R. D., 477.
Barnard, W. G., 3044.
Barnes, E. M., 1425, 2732.
Barnes, J. E., 2962, 3260.
Barnes, J. M., 491.
Barnes, L. E., 2767.
Barnes, R. H., 3549.
Barnett, A. J. G., 3259.
Barnett, H. C., 2275.
Barnum, D. A., 3057, 3058.
Barone, R., 1422.
Barr, F. S., 1142.
Barr, L. M., 2840.
Barr, M. L., 627.
Barrentine, B. F., 3226.
Bartell, P., 1958.
Bartha, A., 826.
Bartík, M., 1010.
Bartlett, D. E., 1897.
Bartley, E. E., 609, 981.
Bartmann, K., 2236.
Bartter, F. C., 250.
Barwell, C. F., 1626.
Bashkirov, B. A., 1782.
Baš-Luketić, L., 353.
Basset, J., 119, 688, 1645.
Bassett, E. G., 2740.
Bates, C. M., 247, 534.
Battaglia, S., 2352.
Batty, I., 1996.
Bauer, F., 1219.
Bauer, G. C. H., 3898.
Bauer, H., 1863, 2700.
Bauer, T., 957.
Baugh, V. S. G., 3040.
Baum, S., 964.
Bauman, H. E., 2511.
Baumann, C. A., 1347.
Baumann, R., 714, 3685.
Baumgärtner, L., 2904.
Baumgartner, H., 1500, 1537.
Baumnhover, A. H., 868.
Baxter, C. F., 1413.
Baxter, D., 1844.
Baxter, J. T., 1881, 2955.
Bayley, N. D., 1030.
Bazdyrev, K. P., 2567.
Bazex, A., 1190.
Bazulev, P. M., 1244.
Bazvilev, N. M., 3511.
Beakley, W. R., 641, 642, 643, 644, 645, 646.
Beall, G., 1794, 1795.
Beames, R. M., 1214.
Beams, H. W., 2841.
Bean, W. B., 3004.
Beard, D., 175, 176, 1281.
Beard, J. W., 175, 176, 177, 1281, 2655.
Bearden, H. J., 1813.
Beattie, H. E. R., 70, 72, 423.
Beaudette, F. R., 448.
Beauregard, M., 1865.
Beaven, D. W., 2066.
Beck, A. B., 3560.
Becker, 727.
Becker, D. E., 2045.
Becker, M., 2816.
Becker, W., 1934.
Becklund, W. S., 3515.
Bednář, B., 411, 412.
Bedson, S. P., 1904.
Beech, M., 3504.
de Beer, E. J., 1688.
Beer, J., 1767, 3606.
Beerwerth, W., 1109, 3249, 3686.
Beesley, W. N., 165.
Begović, S., 195.
Behrens, H., 350.
Beijers, J. A., 2407, 2988.
Béke, L., 125.
Béládi, I., 1608, 1946, 1949.
Béládi, I. O., 816.
Belcher, J., 3486.
Belding, R. C., 2517, 3170.
Belenki, N. G., 3644.
Bell, A. T., 3003.
Bell, E. J., 139, 1324.
Bell, J. A., 58.
Bell, J. F., 1177.
Bell, J. M., 902.

Bell, R. R., 586, 2936.
Bell, W. B., 245.
Bell, W. N., 551, 552.
Di Bella, A., 3096.
Beller, K., 121.
Bellet, S., 1362.
Bellocq, B., 2566.
Belonje, C. W. A., 2746.
Belton, F. C., 2480, 3064.
Bemrick, W. E., 3207.
Bendixen, H. C., 108.
Bendtsen, H., 1544.
Benedict, A. A., 2909, 3505.
Benelli, C., 2096.
Benesch, F., 1038.
Beninati, F., 1678.
Benjamin, H. B., 3625.
Benko, V., 2570.
Bennet, G. H., 3757.
Bennetts, H. W., 1717.
Benson, G. K., 2721, 3950.
Benson, J., 2355.
Benson, R. E., 1108, 3356.
Benson, R. H., 248.
Bentinck-Smith, J., 737.
Bentley, E. W., 1021, 2734.
Bentz, 3257.
Bentz, H., 1760, 3607, 3609.
Benzie, D., 2669.
Béquignon, R., 2864, 3142.
Berbinschi, C., 1609.
Beresford, C. R., 247.
Bereznay, T., 814.
Berge, E., 2762, page 410.
Bergendahl, E., 2412.
Berger, H. -J., 3254, 3289.
Berger, K., 445, 2597.
Berger, R., 2634.
Berger, W., 3035.
Berglund, K., 3509, 3828.
Bergman, E. N., 3404, 3405.
Bergman, S., 1202.
Bergmann, J., 354, 745, 774.
Bergsma, C., 1872.
Bern, H. A., 1722.
Bernhard, W., 3873.
Berrier, H. H., Jr., 1366.
Berrios, L. A., 2931.
Bertagna, P., 1655.
Berteaux, S., 694.
Bertrand, M., 1269.
Bessis, M., 1479.
Best, C., 3993.
Beswick, T. S. L., 1613.
Bethell, F. H., 2342.
Bethlem, M. L. B., 235.
Bettinger, J. C., 1362.
Betts, A. O., 456, 457, 458, 459, 2608.
Betty, R. W., 1892.
Betzel-Langbein, H., 394.
Beveridge, E., 2579.
Beveridge, W. I. B., 456, 457.
Bhatnagar, D. S., 3292.
Bhattacharya, P., 3292, 3307.
Bianca, W., 1063, 2091.
Biberstein, E. L., 50, 2220, 2840, 3731.
Bichel, J., 1904, 2551.
Bicknell, S. R., 3216.
Bielański, W., 1919.
Bieling, R., 1236.
Bierer, B. W., 3084.
Bieri, J. G., 1724.
Biering-Sørensen, U., 2252.
Biester, H. E., 748.
Biggers, J. D., 1445, 2741, 3290.
Biggi, P., 365.
Biggs, P. M., 3874.
Biggs, R., 1457.
Bilbey, D. L. J., 1796.
Bilek, J., 2424.
Billingham, R. E., 2728, 3824.
Bindrich, H., 1634, 3178.
Binello, D., 289.
Binet, L., 2097.
Bingham, E., 2228.
Bingham, E. L., 3415.
Binns, W., 2380.
Biondo, G., 813, 1678.
Bird, H. H., 2914
Bird, H. R., 899, 3557.
Birkett, J. D., 2146, 3656.
Bíró, Z., 1550.
Bisby, G. R., 1474.
Bischoff, J., 2733, 3705.
Bishop, M. W. H., 277, 621.
Bitter, B. A., 868.
Bivens, J. A., 448.
Black, A. L., 1413, 2421, 2422.
Black, J., 1230, 1231, 1232.
Black, J. J., 448.
Blackburn, P. S., 1095, 3346, 3949.
Blackmore, J. S., 2274.
Blackshaw, A. W., 72, 622, 3635.
Blackwell, R. L., 893.
Blanc, G., 860.
Blanco Loizelier, A., 770.
Blattner, R. J., 467, 2901.
Blaxland, J. D., 3381, 3737.
Blaxter, K. L., 531, 927, 1314, 2973, 3554, 3883.
de Blieck, L., 802, 803, 804.
Bligh, J., 598.
Blincoe, C., 1015.
Blom, E., 2108.
Blood, D. C., 557, 935.
Blore, I. C., 2787, 3603.
Blount, R. E., 3442.
Blount, W. P., 1776.
Blum, L., 1293.
Boake, W. C., 2474.
Boccabella, R. A., 628.
Boch, J., 148, 164, 167.
Boda, K., 2800.
Boddie, G. F., 4002, page 602.
Bodian, D., 1606.
Bodingbauer, J., 227.
Bodon, L., 1940.
Böhm, L. K., 2020.
Böhning, F., page 508.
Bölcsházy, K., 297.
Bömer, H., 302, 3581.
De Boer, C. J., 1239.
Börnfors, S., 107, 1972, 3163, 3805.
Boero, J. J., 147.
Böttiger, L. E., 1405.
Boev, S. N., 3537, 3538.
Bogart, R., 2443, 3015.
Bogumill, G. P., 1755.
Boguth, W., 313.
Boháč, J., 411, 412, 440.
Bohl, E. H., 1173, 3114.
Bohning, F., 3657.
Bohosiewicz ,M., 2074, 3256.
Bohrod, M. G., 3924.
Boĭko, A. A., 3447.
Bois, P., 3899.
Boisvert, H., 1850.
Bokkenheuser, V., 2191.
Bokori, J., 239.
Bol', B. K., 4003, page 602.
Bol', K. G., 4003, page 602.
Boley, L. E., 1552.
Boley, L. T., 3974.
Bolliger, A., 256.
Bollini, V., 2979.
Bolshakov, I. G., 2711.
Bolton, E. T., 2756, page 360.
Bolton, R., 2181, 2182.
Bonadonna, T., 2110.
Bonaduce, A., 753, 1649, 2156.
Bond, T. E., 1809.
Boné, G. J., 3753.
Bone, J. F., 564.
Bonfert, M., 1025.
Bongi, A., 1443.
Del Bono, G., 2667.
Boogaerdt, J., 2672.
Boor, A. K., 1487, 1488, 1489.
Booth, N. H., 2818.
Borchert, A., 1307, 1328, 2078, 2629.
Borell, U., 3975.
Borg, U., 3213.
Borges Ferreira, L. D. B., 3519.
Borisovich, Y. F., 1848.
Born, G. V. R., 2086.
van den Born, J. M., 2466.
Bornstein, S., 1869.
Borodina, L. T., 1888.
Borodulina, N. A., 2524.
Bos, K., 802.
Bosch, S., 2673.
Bosio, G., 3109.
Bosshardt, D. K., 3549.
Bosticco, A., 2678.
Boszjan [Boshyan], G. M., 856.
Botti, L., 3481.
Bouckaert, J. H., 974.
Boulangé, M., 2967.
Boulanger, P., 137, 952.
Bouman, J., 3904.
Bourdelle, E., 3053, page 360.
Bourlière, F., 3053, page 360.
Bourne, G. H., 1082, page 52.
Boutler, M., 1007.
Bouvier, G., 2002.
Bouw, J., 3283.
Bowden, R. S. T., 3248.
Bowie, W. C., 1709.
Bowler, R. J., 1706.
Bowman, I. B. R., 3259.
Bowsher, D., 263.
Boyarshinov, P. K., 1104.
Boyd, G. A., 1839, page 177.
Boyd, H., 1179.
Boyden, S. V., 1506, 1851, 1852, 3683.
Boyne, A. W., 2658, 2669.
Bozhko, G. K., 1162.
Bracken, E. C., 3468.
Braço Forte, M. C., Jr., 85.
Braden, A. W. H., 282.
Bradford, W. L., Jr., 331.
Bradish, C. J., 3149.
Bradley, R. E., 507.
Bradley, T. R., 3951.
Braham, J. E., 2052.
Brahic, J., 1546.
Brambell, F. W. R., 3825.
Brammell, W. S., 3894.
Brand, T. A., 1979.
Brandly, C. A., 129, 841, 1275, 1838, 1976, 2057, 2058, 3412, page 246.
Brandt, A., 584, 2702.
Bras, G., 3935.
Brass, W., 656.
Brătescu, A., 1588.
Bratke, E., 1501.
Braude, R., 198, 458, 1701, 1705, 1706.
Braun, H. A., 1362.
Braun, W., 1071.
Brauner, 2891.
Bray, R. W., 1823.
Brecher, G., 2397.
Breen, H., 3413.
Brega, A., 2557.
Breirem, K., 515.
Bremner, K. C., 500.
Brenner, L. Y., 3392.
Brent, L., 3824.
Bridges, C. H., 3864.
Bridges, R. G., 3297.
Briefman, L., 2186.
Brien, P., 1073.
Briggs, C. A. E., 2478.
Briggs, G. M., 3573.
Briggs, P. K., 2033.
Brill, J., 716, 722, 723, 1150, 2783.
Brindley, T. A., 2079.
Brinkhous, K. M., 306.
Brion, A., 426, 950, 1269, 1993, 2907.
Brisson, G. J., 653, 1707.
Britten, R. J., 2756, page 360.
Brock, R., 2372.
Brock, W. E., 3140.
Brocq, P., 2124.
Brodauf, H., 634.
Brodey, R. S., 2650.
Brodhage, H., 56, 3397.
Brody, S., 990, 1014, 1015, 1016, 1412, 3272.
Brolin, S. E., 3995.
Brook, A. H., 3268.
Vander Brook, M. J., 3267.
Brooks, J., 999.
Brooks, M. E., 1892.
Brooks, N. E., 2755.
Brooks, O. H., 2633.
Brooksbank, N. H., 1299, 1384.
Brooksby, J. B., 3149, 3770.
Bross, I. D. J., 767.
Brotherston, J. G., 96.
Brouwer, E., 3893.
Brown, A. L., 392.
Brown, C. W., 96.
Brown, D. V. L., 231.
Brown, H. W., 886.
Brown, M. A., 1413.
Brown, R., 2181.
Brown, R. A., 2914.
Brown, R. D., 858.
Brown, R. W., 3666.
Brownlee, A., 3876.
Bruce, H. M., 3640.
Brueckner, A. L., 130, 1235, 1611, 1953, 3499.
Brückner, H., 910.
Brüggemann, J., 924.
Brünner, F., 536.
Brues, A. M., 3253.
de Bruin, J. J. M., 1065.
Brumbaugh, J. H., 2410.
Brumby, P., 212.
Brunaud, M., 1017.
Bruneau, J., 860.
Bruner, D. W., 737.
Brunson, J., 1294.
Bryan, H. S., 1552, 1882.
Bryans, J. T., 1621, 2281, 2876, 2878.
Bryant, M. P., 3750.
Bryant, R. L., 2414.
Bryner, J. H., 1897.
Bu, I., 1184, 1441.
Bucca, M. A., 3152, 3819.
Bucco, G., 3181.
Buchanan, A. R., 1398.
Buck, G., 469.
Buckley, J. J. C., 2018.
Bucy, L. L., 966.
Buddle, M. B., 382, 1572.
Budtz-Olsen, O., 1417.
Bürki, F., 3394.
Bugeac, T., 1541, 1542.
Bugyaki, L., 1963, 2293, 2580.
Bull, L. B., 3621.
Bulling, E., 2177.
Bullington, T. H., 2705.
Bunde, C. A., 1403.
Bunding, I. M., 2365.
Bunn, C., 2602.
Bunn, C. E., 249.
Bunnell, R. H., 2043, 2044, 3572.
Bunyan, J., 1698, 1699.
Burch, G. R., 1403.
Burgisser, H., 1166.
Burkhart, R. L., 1233.
Burmester, B. R., 174, 1695, 2029, 2951, 3170, 3223.
Burnet, F. M., 1237, 3046, 3183.
Burnet, F. Macfarlane, 3779.
Burns, K. F., 1228, 1951.
Burns, R. H., 1763.
Burr, W. E., 3423.
Burrell, P., 185.
Burroughs, W., 2447.
Bursell, E., 1671.
Burton, J. M., 3958.
Buruiana, L. M., 3598.
Buša, V., 888.
Bush, J. A., 1359, 2038, 2367, 2968, 3559.
Bush, L. F., 2112.
Bushland, R. C., 868, 1304, 2628.
Bushnell, O. A., 3884.
Buss, W., 45.
Bussiéras, J., 2382, 3139.
Bussinello, E., 3116.
Butler, H. C., 2815.
Butler, J. A. V., 2432.
Butz, H., 2455.
Buxton, J. C., 1299.
Buxton, P. A., 2759, page 177.
Buza, L., 2311.
Buzna, D., 1531.
Byrd, C. E., 2705.
Byrne, R. J., 761, 1554.
Byrnes, V. A., 231.

Cabannes, R., 2088.
Cabasso, V. J., 3807.
Cacchione, R. A., 3390.
Cadilek, A. E., 1239.
Cąkałowa, A., 472, 1277, 2310.
Caldas, A. D., 3387, 3388.
Calder, A. F. C., 1353, 1702.
Calhoun, E. L., 2804.

Calhoun, M. L., 329.
Calisti, V., 293.
Callahan, C., 2208.
Callaway, D. W., 1753.
Callis, J. J., 815, 1943, 2265, 2590.
Callow, D. S., 3646.
Callow, L. L., 1774.
Camand, R., 2259.
Camargo, N. F., 3151.
Camargo Nuñez, F., 1952.
Camber, B., 1064.
Cameron, G. R., 2993.
Cameron, H. S., 3103, 3389, 3419.
Cameron, J., 2495, 2779.
Cameron, T. W. M., 4000, page 508.
Campbell, B., 3630.
Campbell, C. H., 498.
Campbell, D. J., 1009.
Campbell, J. G., 3871.
Campbell, R. C., 456, 1435, 1706, 2608.
Campbell, R. S. F., 436.
Campbell, W. C., 3849.
Van Campenhout, E., 920.
Campins, H., 2553.
Canaway, R. J., 2751.
Canham, A. S., 809.
Cano, A., 2441.
Cano, C., 749.
Cantner, D. E., 2718.
Cantrell, W., 2842.
Caparrini, W., 1967.
Carbonero Bravo, D., 2111.
Carda Aparici, P. C., 1176.
Cardassis, J., 1370, 3138, 3238.
Cardenas R. R., Jr., 1724.
Carjevschi, I., 1516.
Carll, W. T., 580.
Carlson, R. G., 3472.
Carlsson, A., 3898.
Carlström, G., 3917.
Carman, P. E., 1142.
Carmichael, J., 3433.
Carminati, G. M., 3131.
Carnaghan, R. B. A., 960, 3227, 3737.
Carneiro, V., 1232.
Caroline, L., 60.
Carpenter, P. L., 3047, page 360.
Carr, C. W., 532.
Carrère, L., 2537.
Carrie, M. S., 3985.
Carrington, L. B., 3401.
Carstensen, H., 3095.
Carstensen, H.-C., 1597.
Cartella, I., 1035.
Carter, G. R., 23.
Carter, H. B., 1461.
Carter, M. W., 1451.
Cartrite, H. T., 3594.
Cartwright, G. E., 1359, 2038, 2367, 2968, 3559, 3561.
Caruolo, E. V., 1795.
Carvalho da Silva, A., 1726.
Carver, J. S., 2958.
Casarosa, L., 559, 1803.
Case, A. A., 2710.
Casey, D. J., 3835.
Casida, L. E., 287, 294, 1342, 1433, 1823, 2452, 3969, 3980.
Castro, E. R., 1220, 1978.
Catellani, G., 3542.
Cathie, I. A. B., 1985.
Catron, D. V., 1710, 2972.
Cauthen, G. E., 2642.
Cavanaugh, D. J., 3765.
Cavier, R., 1329, 2348.
Cawley, A. J., 3956.
Cawley, E. P., 3791.
Cazal, P., 3052.
Ceccarelli, A., 1579.
Cedro, V. C. F., 3390.
Cerni, I., 1404.
Cernohous, J., 1327.
Cerruti, C. G., 2600.
Chabaud, M. A., 444.
Chabbert, Y., 984.
Chabr, L., 453.
Chaikoff, I. L., 228, 524.
Chalanka-Kwartowa, H., 838.
Chalmers, C. H., 1083.
Chamberlain, H. V., 3068, 3503.
Chamberlain, R. W., 1956, 3460, 3461.
Chambon, L., 2498, 2499.
Champion, L. R., 2736.
Chan, K. F., 886.
Chanda, R., 3002.
Chandler, A. H., 3440.
Chandler, R. L., 2175, 2494.
Chandrasekharan Nair, K. P., 509, 2693.
Chang, M. C., 285.
Chang, S., 130, 1235.
Chang, S. C., 3499.
Chanock, R. M., 470.
Chaproniere, D. M., 2309.
Charles, J., 725.
Charles, J. A., 315.
Charton, A., 2666.
Chatelain, R., 1185.
Chattaway, F. W., 64, 1908.
Chaudhari, P. G., 874.
Chen, T. T., 1414.
Cheng, E., 2447.
Chepaev, I. P., 1133.
Chereshnev, N. A., 2926.
Cherkasski, E. S., 1672.
Chernysheva, M. I., 2530.
Chesney, R. W. L., 3925.
Chevé, J., 49, 3730.
Cheyroux, M., 1893.
Chi'en Liu., 3806.
Chiesa, F., 2110.
Chingaev, I. F., 1106.
Chinn, H. I., 267.
Chisholm, J. S., 3985.
Chiung, Puh Lee, Y., 1356, 3570.
Chládecky, F., 1575.
Chodkowski, A., 3719, 3720.
Choh Hao Li, 986, 987, 3021.
Chomse, H., 3605.
Chong Sue Kheng, 1279.
Chopra, R. N., 326.
Choquette, L. P. E., 3522.
Chorley, J. K., 2003.
Chotisen, A., 1981, 2315.
Choudhury, B., 875.
Chow, T. L., 3470.
Christensen, G. C., 624.
Christensen, J. F. 76.
Christensen, P. M. 1653, 1654.
Christian, E. J., 3253.
Christian, J. J., 309.
Christiansen, F. J., 548.
Christiansen, M., 1544.
Christodoulou, T., 410.
Christoph, H.-J., 652, 3869.
Chung, A. C., 546, 547, 548.
Chute, H. L., 402.
Chwojnowski, A., 54.
Cibis P. A., 231.
Cilli, V., 2892.
Ciolca, A., 1584, 1588.
Cirstet, I., 408.
Cisale, H. O., 3390.
Clabby, J., 3216.
Clandinin, D. R., 2133.
Clapp, K. H., 66, 67.
Clarenburg, A., 2479.
Claringbold, P. J., 1444, 1445, 2308, 2741, 3184, 3290.
Clark, J. J., 3617.
Clark, R., 3240, 3241.
Clark, W. R., 513.
Clarke, E .A., 2695.
Clarke, E. G. C., 2077.
Clarke, E. R., Jr., 3358.
Clarke, M. K., 2564.
Clarke, P. M., 3951.
Clarkson, M. R., 1372.
Clarkson, T. B., 1142, 2046.
Claydon, T. J., 609.
Clegg, F. C. 2998.
Clements, F. E., 778.
Clements, F. W. 2686.
Clemons, O., 3402.
Clifford, R. J., 2031.
Clifton, C. E., 1069.
Clover, R. H., 251.
Coalson, R. E., 2230.
Coates, H. V., 3908.
Coates, M. E., 1348, 1349, 1701.
Coats, D. A., 2417.
Cochran, K. W., 3506.
Cochran, W. G., 1087.
Cockburn, R. S., 980.
Coffin, D. L., 2390, 3806.
Coghlan, J. D., 3115.
Coghlin, C. L. C., 1746.
Cohen, J., 1363.
Cohen, P., 948.
Cohrs, P., 205, 1048.
Coker, C. M., 499.
Cole, C. R., 810.
Cole E. J., 1137, 2766.
Cole, H. H., 3971.
Cole, L. R., 1502.
Cole, R. D., 1414.
Cole, R. K., 1819, 2028.
Cole W. H., 1477.
Coleman, N., 1221, 3765.
Coles, G. M., 1879.
Coles, R., 2026, 2027.
Colglazier, M. L., 881, 3532.
Colin, E. C., page 508.
Collery, L., 3996.
Collet, P., 237.
Collier, W. A., 87.
Collin, P., 2819.
Collings, P. C., 858.
Collins, D. H., 3602.
Collins, J. H., 3417.
Collins, J. J., 1638.
Colover, J., 2488.
Colter, J. S., 2014.
Coman, I., 1607.
Comar, C. L., 230, 654, 2087, 2703, 2764, 3265.
Comyn, M., 1543, 3716.
Condie, R. M., 2916.
Conforti, 1567.
Conner, E., 3401.
Connolly, J. M., 484, 485, 486.
Conrad, H. R., 518.
Consden, R., 2488.
Consoli, G., 1650.
Constant, M. A., 3225.
Contini, A., 1101, 1290.
Cook, M. K., 435.
Cook, R., 1147, 2006.
Coombs, R. R. A., 1299.
Coons, A. H., 484, 485, 486.
Cooper, D. M., 275, 797, 1811.
Cooper, E. R. A., 1691.
Cooper, K. E., 335.
Cooper, M. S., 2159.
Coraboeuf, E., 2097.
Corcoran, J. F., 3526.
Cordier, R., 1073.
Cordier-Boullangier, G., 1651.
Cordy, D. R., 1206, 2885, 3002, 3880.
Corrias, A., 1586.
Corsico, G., 1758, 2400.
Corvazier, R., 1893.
Cosar, C., 2082.
Cosgrove, K. W., Jr., 2974.
Cosnett, L. S., 3959.
Costello, L. C., 3758.
Cotchin, E., 3540, 3589.
Cottereau, P., 426, 950, 1269.
Cottew, G. S., 1526.
Cottier, G. J., 2063.
Cottral, G. E., 2132, 3170.
Couch, J. R., 796, 930.
Cover, M. S., 1284, 1754, 2320.
Cowan, J. H., 3700.
Cowan, S. T., 1903.
Cowie, A. T., 3950.
Cowie, D. B., 2756, page 360.
Cowlishaw, B., 927.
Cox, C. D., 1887.
Cox, D. D., 3849.
Cox, H. R., 1233, 2914.
Crabb, W. E., 2788.
Craddock-Turnbull, J. N., 1706.
Cragle, R. G., 2106.
Crane, C. W., 2960.
Crasemann, E., 515.
Crawley, J. F., 851, 2563, 3500.
Creamer, A. A., 392.
Creutzberg, F., 2442.
Crews, F. W., 3376.
Crick, F. H. C., 2912.
Cristescu, M., 1541, 1542
Cristet, I., 1520, 1578, 1607.
Cristodoulou, T., 817.
Croft, P. G., 1387, 3036.
Crofton, H. D., 880.
Crone, P. B., 2164.
Cronin, M. T. I., 144.
Crookshank, H. R., 1344.
Crosland-Taylor, P. J., 488.
Cross, M. H., 712.
Cross, R. F., 3514.
Crossley, M. L., 2652.
Crowe, E. W., 2281, 2878.
Crowe, M. E. W., 1621.
Crowson, C. N., 3255.
Cruickshank, A. H., 3948.
Cruickshank, J. C. 752.
Cseh, S., 297.
Csernyánszky, H., 1297, 1298.
Csontos, J., 53, 758.
Cuckler, A. C., 805, 1591, 3215.
Cullison, A. E., 2445.
Cumming, R. B., 3232.
Cummings, M. M., 2166.
Cunha, J. M. V., 1906.
Cunningham, C. H., 123, 3170.
Cunningham, H. M., 653, 1707.
Cunningham, I. J., 2368 3005.
Cunningham, M. P., 2346.
Curnow, D. H., 184.
Cutchins, E. C., 3763.
Cvetanović, V., 786.
Cvetković, L., 1594.
Czajkowski, Z., 640.
Czarnowski, A., 2226.
Czekalowski, J. W., 2202.
Czernicki, B., 625.

Daane, T. A., 986.
Dabrigeon, J., 3078.
Dąbrowski, T., 4, 2520, 2789.
Dafaalla, E. N., 3422.
Daglio, C. A. N., 1196.
Dahme, E., 1385, 2389, 3767.
Daigeler, A., 613.
Dailey, J. S., 3738.
Dain, J. A., 1697.
Dalcq, A., 1073.
Dale, F. H., 1357.
Dale, H. E., 1412, 3272.
Dale, W. A., 310.
Daley, R., 2208.
Dalgaard-Mikkelsen, S., 3942.
Dalgarno, A. C., 2669.
Dallenbach, F., 1393.
Daly, G. D., 808.
Daly, R. A., 1461.
Damseaux, J., 3001.
Dandamaev, S. G., 2675.
Dane, D. S., 3504.
Danielli, J. F., 1082, page 52.
Danskin, D., 829.
Dardiri, A. H., 2064.
Darlow, A. E., 2670.
Darné, A., 3999.
Dartois, N., 132.
Das, K. M., 1326.
Daskalos, A. M., 2266.
Dauzier, L., 283, 3026, 3027.
Davenas, P., 3078.
Davenport, M. E., Jr., 2365.
Davey, J. B., 2126.
Davies, A. W., 1699.
Davies, B. P., 2396.
Davies, D. A. L., 3040.
Davies, D. G., 687.
Davies, G. M., 3937.
Davies, J. R., 387.
Davies, M. K., 1348, 1701.
Davies, S. F. M., 1216, 1775.
Davis, C. L., 2351.
Davis, D., 561.
Davis, D. E., 3173.
Davis, E. C., 1302, 1462.
Davis, G. K., 203, 2964.
Davis, J. G., 3660, page 508.
Davis, O. F., 1756.
Davis, P. N., 526, 3907.
Davis, T. J., 2446.
Davis, W. E., Jr., 16.
Davson, H., 996.
Davydova, M. V., 1316.
Dawe, E. C. S., 668
Dawes, G. S., 264, 2086.
Day, M. F., 479, 2617, 3488, 3489.

Day, P. L., 2974, 3576.
Deadrick, R. E., 1724.
Deberdt, A., 1308, 3199.
Dedié, K., 300, 390, 1115, 1180, 1767, 2462, 3090, 3607.
Deem, A. W., 3261, 3470.
DeFoliart, G. R., 3837, 3838.
Deiana, S., 1680.
Deichmiller, M. P., 2025.
Dekeyser, P. -L., 3053, page 360.
Dekker, N. D. M., 949, 2382.
Delage, B., 1267, 3809, 3810.
Delak, M., 2934.
Delany, L. T., 3936.
Delaplane, J. P., 229, 796, 3173, 3501.
DeLay, P. D., 451, 2208, 2466.
Delić, S., 2848.
Dellmann, H. D., 3010.
Delmonte, L., 3555.
Dembiczak, C. M., 1794, 1795.
Dempsey, M., 1787.
Dempsher, J., 1606.
Dempster, G., 2509.
Denisenko, I. F., 2288.
Dennington, E. M., 2136.
Dennis, W. R., 891.
Denton, C. A., 541.
Denton, D. A., 2417, 2724, 3564.
Déom, J., 370, 713, 2224, 2225, 2849.
Depoux, R., 2269.
Derbal, Z., 1689.
Desbordes, J., 17, 1121.
Desbuleux, 946.
Deschiens, R., 152.
Desowitz, R. S., 2241, 2568, 3428.
Detweiler, D. K., 956.
Deubler, M. J., 1137, 2766.
Deulin, T., 920.
Deverell, M. W., 3723.
Devilliers, C., 1073.
DeVolt, H. M., 3758.
Devos, A., 355, 742, 1153.
Dexter, L., 3286.
Dhanda, M. R., 679, 715, 1871, 1916.
Dhennin-Salomon, Léone, 997.
Dhennin-Salomon, Louis, 997, 1042.
Diageler, A., 3704.
Dias, E., 2339.
Dick, A. T., 3621.
Dick, D. A. T., 2429.
Dick, G. W. A., 114, 115.
Dicke, R. J., 236, 2861.
Diczfalusy, E., 3075.
Diernhofer, K., 38, 1530, 1718, 3157.
Diesel, A. M., 3586.
Dietz, O., 2327.
Diez, M., 3663.
Van Dijck, P., 591.
Dillon, J. F., Jr., 3149.
Dillon, R., 2692.
Dimopoullos, G. T., 443, 815.
Dineen, J., 1040.
Dinning, J. S., 2974, 3576.
Dinter, Z., 389.
Direnko, P. M., 3782.
Dirksen, G., 1406, 3242.
Dixit, S. G., 1548.
Dixon, F. J., 2625.
Dixon, J. E., 430.
Djanian, A. Y., 3507.
Dmitriev, A. I., 2607.
Dobberstein, J., 3055, page 410.
Dobson, M. J., 268.
Dodd, D. C., 1574, 3601.
Dodd, F. H., 3342, 3343, 3344, 3345.
Doeglas, A., 2684.
Döhmen, H., 2025.
Doeksen, J., 2636.
Doğuer, M., 2561, 2598.
Dohlman, C. -H., 271.
Doležal, M., 2532.
Doll, E. R., 1621, 2280, 2281, 2876, 2878.
Dollahite, J. W., 1769.
Dollfus, R. -P., 3053, page 360.
Dolman, C. E., 3060.
Dol'nikov, Y. Y., 3530.
Dombek, R., 411, 412, 441.
Domermuth, C. H., 1207, 2237.
Di Domizio, G., 421.
Donald, L. G., 3940.
Donaldson, A. W., 1332.
Donaldson, J. D., 247.
Done, J. T., 565.
Donovan, G. A., 193.
Doolette, J. B., 67.
Dorante, M., 2553.
Doronin, N. N., 2833.
Doroshko, I. N., 3777, 3778.
Dorsman, W., 3196, 3844.
van Dorssen, C. A., 24, 1127, 1154, 1278.
Dosch, F., 3360.
Dougherty, E., 2394.
Dougherty, R. M., 2022.
Dougherty, R. W., 624, 1697, 1827.
Douvres, F. W., 3853.
Dowling, D. F., 599, 992, 993.
Dowling, M. A. C., 3216.
Downe, A. E. R., 1292.
Downie, A. W., 1994.
Downing, W., 879, 1569.
Doyle, L. P., 1964, 2369, 2502, 2956.
Doyle, T. M., 3801.
Dozza, G., 246.
Dräger, K., 726.
Drăghici, D., 1504, 1629.
Driessen, J., 1872.
van Drimmelen, G. C., 385, 1538, 1540, 1877.
Drouhet, E., 1191, 2228.
Drudge, J. H., 503.
Druett, H. A., 2539.
Dry, F. W., 1055, 1057.
Dryden, L. P., 2661.
Dubos, R. J., 1070, 1186, 1847, 1858, 3680.
Duckworth, J., 2669.
Dudley, F. H., 868.
Dürr, E., 10.
Dufour, E. H., 1510.
Duguid, J. P., 2509.
Duhamel, L., 194.
Duil'ko, N. I., 1931.
Dukes, H. H., 1842, page 177.
Dukić, R., 1243, 2877.
Dulfano, M. J., 1394.
Dumanovsky, F., 1049.
Dumić, A., 942.
Dumith Arteaga, G., 3724.
Dumont, B. -L., 3275, 3276.
Dun, R. B., 2125.
Duncan, D. C., 1364.
Duncan, D. W., 1625.
Duncan, W. R. H., 2973.
Duncombe, W. G., 2722, 3281.
Dunham, W. B., 1508.
Dunlop, D., 247, 534.
Dunn, A. M., 1687.
Dunn, D. R., 885, 3858.
Dunne, H. W., 734, 3475.
Dunsmore, J. D., 935.
Durand, P., 75.
Duranti, G., 2782.
Durbin, C. G., 162, 3417.
Durham, W., 585.
Durieux, J., 2666.
Durrell, W. B., 179, 1346.
Durusan, R., 2561.
Dutilloy, Y., 378.
Dutt, R. H., 2112.
Dutta, B. N., 785.
Dyce, A. L., 1641.
Dyce, K. M., 3589, 3957.
Dye, J. A., 1367, 2047.
Dyer, I. A., 1345, 3648.
van Dyke, H. B., 2431.
Dyl'ko, N. I., 1596.
Dyssegaard, A., 366, 367.
Dzenis, L., 223.
Dzerzhinski, A. Y., 746.
Džinleski, B. G., 2812.
Dziobkiewicz, H., 82.
Dziuk, H. E., 269, 2093.

Eadie, J. M., 2254.
Eads, R. B., 818.
Earl, E. R., 317.
Earl, F. L., 1382, 2385.
Easterbrooks, H. L., 1171, 1561, 3092.
Eaton, G., 980.
Eaton, H. D., 1794, 1795, 3572.
Eaves, G., 2202.
Eayrs, J. T., 3280.
Ebaugh, F. G., Jr., 1008.
Eckbert, E. A., 175, 176.
Eckles, N. E., 1009.
Eckstein, P., 1085, 2471, 2761, page 360.
Edds, G. T., 3270.
Eddy, G. W., 866.
Edeson, J. F. B., 2018.
Edgar, D. G., 3306.
Edgar, G., 3621.
Edgar, S. A., 73, 3203.
Edipides, T., 1645.
Edlinger, E., 849.
Edmondson, J. E., 3749.
Edmunds, P. N., 2509.
Edrisinghe, E. F., 3041.
Edson, E. F., 1764.
Edward, D. G. ff., 2235.
Edwards, C. D., 1486.
Edwards, D. A. W., 1469.
Edwards, E. E., 1415, 2240.
Edwards, J., 1435.
Edwards, P. R., 3702.
Egerer, E., 959.
Egerton, J. R., 1684, 3215.
van Egmond, P. J. D., 947.
Egner, W., 1.
Egorov, I. A., 1312.
Egyed, M., 3943.
Ehlers, M. H., 2107.
Eichler, W., 490, 3622.
Eidson, M. E., 2592.
Eikmeier, H., 2022.
Eiseman, G., 2839.
Eisenstark, A., 2314, 3373, 3816.
Eisma, W. A., 2881.
Eissa, Y. M., 3747.
Eissner, G., 1111.
Elam, G. W., 503.
Elcoate, P. V., 1361.
Elder, C., 1255.
Elder, W. H., 578.
Eldridge, F. E., 1046.
Elek, P., 691, 1496, 2900.
Elias, J. J., 1722.
Ellenberger, H. B., 523.
Elliott, F. I., 1429.
Elliott, R. A., 2332.
El-Sheikh, A. S., 1433, 3969.
Elsworth, R., 3414.
Elvehjem, C. A., 3556.
d'Emden, P. H., 1460.
Emdin, R., 1200.
Emerick, R. J., 3207.
Emerson, C. P., 1008.
Emmens, C. W., 3635.
Emmersen, M. A., 3987.
Emmons, C. W., 58.
Emsbo, P., 3338, page 410.
van den Ende, M., 2290.
Ender, F., 240.
Endo, M., 2490.
Endrejat, E., 739.
Engel, R. W., 245, 2953.
Engel, S. L., 2431.
Englert, H. K., 1863, 1905, 2178, 2356, 3761.
Enigk, K., 1325, 2248, 3760.
Ennik, G.C., 2676.
Ennio, B., 1033.
Ensminger, M. E., 1130.
Ensor, C. R., 1570.
Enticknap, J. B., 2836.
Entwistle, V. P., 2406.
Enzie, F. D., 3532.
Epstein, H., 2694.
Erb, R. E., 281, 2107.
Erbin, I. E., 1164.
Ercegovac, D., 89.
Erdös, J., 1751.
Eremeev, M. N., 2697.
Erichsen, S., 3770.
Erikson, D., 1201.
Eriksson, K., 1456.
Ershoff, B. H., 3571.
Ertürk, O., 407, 2534, 3811.
Erwin, E. S., 3648.
van Eseltine, W. P., 330.
Eskelund, V., 651.
Espinet, R. G., 1602.
Ettala, T., 592.
Evans, A. S., 1652, 3171.
Evans, C. Lovatt, 3271.
Evans, H. M., 1727, 2371.
Evans, I. A., 1399.
Evans, J. B., 331.
Evans, W. C., 1399.
Eveleth, D. F., 555, 1377, 2017, 3790, 3879.
Evenson, M. A., 386.
Everist, S. L., 3003.
Evseev, N. K., 2362.
Ewald, F. W., 1132.
Ewy, Z., 1789.
Extrom, S. F., 2565.
Eyles, D. E., 1221, 3765.
Eyquem, A., 143, 1999, 2917, 2918, 3555, 3829, 3831.
Eyssen, H., 591.

Faber, J., 4010.
Fabiani, G., 807.
Fabricant, J., 1286, 3496.
Fagan, R., 2056, 3416.
Fagraeus, A., 3509.
Fahey, J. E., 851, 2079, 2319, 2563.
Fain, A., 2338, 2644, 2645, 2646, 2647.
Faine, S., 1553.
Fairbairn, H., 784.
Falaschini, A., 1679.
Farhi, A., 1997.
Farina, R., 2203.
Farinacci, C. J., 1228, 1951.
Farr, M. M., 3430.
Farrar, G. E., Jr., 1478, page 177.
Farrell, K., 3243.
Farrell, R. K., 481, 839, 1975.
Farrell, V. R., 1502.
Fasseaux, P., 2179.
Faure, J., 2096.
Faustini, R., 1784.
Fawcett, E. J., 2753.
Favour, C. B., 1119, 1503.
Fayet, M. T., 2260.
Fazekas de St. Groth, S., 823.
Feaster, J. P., 203, 2964.
Febvre, P., 997.
Fechner, J., 1618, 1864.
Federer, K. E., 812, 3146.
Fedko, P. A., 2589.
Fedyushina, T. M., 1612.
Fehér, D., 826.
Feils, G., 41.
Feja, E., 3713.
Felgate, C. A. G., 2514.
Félix Palacios, L., 3769.
Fellowes, O. N., 443, 815.
Feltman, R., 2070.
Feng, Y. S. L., 3579.
Fenner, F., 845, 1641, 2616, 3087, 3488, 3489, 3490.
Fennestad, K. L., 1092, 2541.
Fenton, J. C. B., 968.
Fenwick, M. L., 1764.
Ferguson, K. A., 599, 2085.
Ferguson, L. C., 1173, 2332, 3114, 3721, 3803.
Ferguson, T. M., 796, 930.
Ferguson, W. S., 908.
Fernald, H. T., 3049.
Fernando, S. T., 3432.
Ferrando, R., 4001, page 508.
Ferrini, R., 678.
Ferris, D. H., 2861, 3771.
Feugeas, C., 925, 3812.
Février, R., 3228, 3229, 3230.
Fey, H., 27, 56, 3093.
Feyel-Cabanes, T., 2393.
Fiedler, C., 3766.
Fiedler, O. G. H., 2005, 2924, 2925.
Fiege, H., 726.
Fiehrer, A., 1401.
Fieldsend, H. F., 1706.
Fieldsteel, A. H., 3483.
Fievez, L., 1330.
Fife, M. A., 3702.
Figorilli, L., 14.
Figueroa, E. S., 1510.
Filmer, D. B., 2695.

Filmer, J. F., 1773.
Fincher, M. G., 2430, page 658.
Finckh, E. S., 2993.
Findlay, J. D., 641, 642, 643, 644, 645, 646, 2095.
Finkel, K. C., 1979.
Fiorentini, H., 1766.
Fischer, G. L., 3914.
Fischer, G. W., 2408.
Fischer, H., 1042, 1458, 3322.
Fischer, K., 1631, 2000.
Fischer, K. R., 852.
Fischer, M. I., 1361, 2744.
Fischer, W., 3218.
Fisher, E., 210.
Fisher, H., 3574.
Fisher, J., 1995.
Fitch, C. D., 2974.
Fitzgerald, P. R., 1922, 2575.
Flanagan, A. D., 1648.
Flannery, D., 1524.
Flatla, J. L., 427.
Fleischer, R., 975.
Flerchinger, F. H., 281, 2107.
Fletcher, D. W., 1345.
Fletcher, J. A., 3359.
Fletcher, O. K., 3819.
Fletcher, R. B., 3739.
Flint, J. C., 3129.
Flipse, R. J., 1027.
Flir, K., 3449.
Floch, H., 33.
Florkin, M., 1073.
Flotemersch, H. J., 1379.
Flückiger, 1600.
Flückiger, G., 383, 2198.
Flynn, R. J., 2929.
Földes, J., 1509.
von Foerster, H., page 246.
Fogedby, E., 1604.
Fogg, D. E., 3215.
Foggie, A., 3520.
Fohrman, M. H., 640.
Foley, G. E., 2825.
Folger, G. C., 3514.
Folk, G. E., Jr., 2719.
Folley, S. J., 525, 2721.
Fomicheva, A. S., 1532.
Fomina, A. Y., 2487.
Fong, J., 2273.
Fontaine, J., 3698.
Fontaine, M., 1993.
Fontanelli, E., 969, 1967.
Forbes, B. R. V. R., 1884.
Forbes, R. M., 966.
Ford, C. M., 3892.
Ford, E. J. H., 2050.
Ford, J., 1582.
Fordham, S., 3903.
Forgacs, J., 580.
Formston, C., 3246.
Forney, R. B., 1403.
Forschner, E., 3728.
Forsius, P. I., 261.
Forsyth, A. A., 581.
Fortushnui, V. A., 735, 3882.
Foster, E. M., 2511.
Fountaine, F. C., 981.
Fourie, P. J. J., 1914.
Fournier, E., 17, 1121.
Fox, J. P., 3775.
Fracasso, B., 2798.
Frade, E., 3053, page 360.
Frahm, H., 3107, 3108.
Franc, Z., 2169.
France, W. H., 582.
Francis, J., 342, 2172, 3079, 3120.
Francis, T., Jr., 3506.
François, A. C., 912.
Frank, A. H., 1897.
Frank, F. W., 3406.
Frank, N. A., 3665, 3666.
Franke, E.-R., 3622.
Franke, H., 1480.
Franklin, M. C., 2033.
Frape, D. L., 2972.
Frappier, A., 1482.
Fras, A., 3690.
Frascaroli, G., 13.
Fraser, I. E. B., 2508.
Frazão, T. L., 2403.
Frazier, L. M., 2838, 3245.
Frechkop, S., 3053, page 360.
Frederick, G. L., 653.
Frederik, G. H., 1127.
Frederiks, H. H. J., 3444.
Freeman, T. D., 303.
Freese, H., 2165.
Frei, W., 777.
Freiberg, R., 1753.
Freitas, D. C., 1906.
Fremming, B. D., 1108, 3356.
French, M. H., 2657.
Frenkel, H. S., 1225, 2857.
Frenkel, J. K., 3441.
Frens, A. M., 515.
Freter, G. G., 3508.
Freudenberg, F., 1714, 2253.
Freudiger, U., 543, 3403.
Freundt, E. A., 1203, 2235.
Frey, H.-H., 596.
Fricsay, M., 3859.
Fried, J. F., 3602.
Friedman, B., 1756.
Friis, T., 991.
Fritsch, R., 3010.
Fritts, D. H., 3856.
Fritzboger, E., 2472, page 360.
Fritzsch, R., 2278.
Fritzsche, K., 788, 1856, 2322, 3793.
Frost, D. V., 539, 540.
Fry, D. E., 848, 1282.
Fry, R., 3592.
Fuchs, F., 2458, 2882.
Fudalewicz-Niemczyk, W., 161.
Fuentes Marins, R., 3769.
Fuhrman, F. A., 1841.
Fujioka, F., 2084.
Fujito, S., 255.
Fujiwara, K., 1936.
Fukuhara, S., 1966, 2276, 3176.
Fukushima, D. K., 3314.
Fukuto, T. R., 3189.
Fukuwara, S., 2323.
Fuller, A. T., 2081.
Fuller, D. S., 3058.
Fuller, J. B., 1393.
Fulthorpe, A., 1178.
Fulton, J. D., 419.
Funk, G., 700.
Funnikova, S. V., 2947.
Furutani, T., 2283.
Fussgänger, R., 1218.
Fuwa, A., 2596.
Fuzii, R., 2596.

Gabel, A. A., 1918.
Gabriel, I., 2113.
Gärtner, K., 111.
Gaggermeier, G., 1117, 3676.
Gailiunas, P., 3834.
Gaillard, J., 1185.
Găină, V., 1588.
Gainer, J. H., 2668.
Gainullin, T. R., 2176.
Galassi, D., 1644.
Gale, D., 1912.
Galeta, J. N., 1284.
Gall, Z., 3944.
Gallagher, C. H., 3896.
Gallemore, J. I., 3513.
Galli, A., 1567.
Gallop, R. C., 3063, 3674.
Gallup, W. D., 192, 2670, 3901.
Gambles, R. M., 3421.
Gandal, C. P., 2717.
Garabedian, G. A., 3507.
Garavaglia, C., 903, 904, 905.
Garcia, J., 2396.
García Ferrero, J. L., 770.
García Mata, E., 88, 812, 3146.
García-Rivera, J., 2030.
Gardiner, J. L., 2852.
Gardner, C. A., 4006.
Garkavi, B. L., 3205.
Garm, O., 1184.
Garren, H. W., 32, 2794.
Garrigus, U. S., 545, 966.
Garrod, L. P., 3122, 3664.
Garton, G. A., 2973.
Garwood, V., 2347.
Gasparini, G., 2889.
Gassner, F. X., 1453, 1454, 3305.
Gates, D. W., 433, 3435.
Gaugusch, Z., 3102, 3709.
Gaulin, J., 1329, 2348.
Gauthier, J., 49, 3730.
Gavrichenkov, A. I., 2185.
Gavrilova, T. S., 3037.
Gdovin, T., 953, 1575.
Gebauer, H., 575.
Gebhardt, L. P., 766.
Gehring, W., 625.
Geissler, R., 78.
Gelenczei, E., 1129.
Geleta, J. N., 2320.
Gellert, R., 3706.
Geneidy, A. A., 2188.
Gennet, L., 3336, page 508.
Gentile, G., 13.
Gentles, M. A., 885.
Gentry, R. F., 174, 3170, 3223.
Geoffroy, M., 1174.
Georg, L. K., 63, 2827, 3124.
Georgescu, L., 1584, 1585.
Georgiev, R., 554.
Gérard, P., 1073.
Gerhardt, P., 386.
Gericke, D., 2486.
Gerlach, F., 2207, 3743.
Gerriets, E. 1022, 1301, 2193.
Gerriets, R. S., 395.
Gerstl, B., 16.
Gessert, R. A., 546, 547.
Geumlek, M., 130, 1953.
Geurden, L. M. G., 355, 742, 1153.
Gharib, H. M., 1322, 1323.
Ghosh, S. 326.
Giacosa, A. M., 3452.
Gibb, J., 1440.
Gibbons, W. J., page 658.
Gibert, P., 1986.
Gibson, E. A., 961.
Gibson, T. E., 502, 1681, 3206.
Giese, A. C., 1841.
Giglietti, A., 101, 102, 1257, 1259.
Gilbert,, Y., 3786, 3787.
Gilfillan, R. F., 2192, 2245, 3380.
Gill, B. S., 801.
Gill, E., 1754.
Gill, J. C., 3990.
Gillespie, J. H., 1225, 2610.
Gilman, J. P. W., 3641.
Gingher, P. 3498.
Ginsberg, A., 495.
Ginsberg, H. S., 2509.
Giovannoni, M., 822.
Girard, A., 194.
Girard, H., 2259.
Girard, O., 1893, 1999.
Girault, A., 1546.
Girotto, V., 1682.
Giroud, P., 132, 133, 1287, 1290, 1659, 1986, 2585.
Gisvold, O., 1081.
Gitter, M., 3737.
Del Giudice, V., 2829.
Glabashki, S., 730.
Glässer, H., Jr., 2606.
Glantz, P. J., 734, 1528.
Glascock, R. F., 525, 2722, 3281.
Glaubiger, A., 3410.
Gledhill, A. W., 114, 115.
Gleis, P. F., 2661.
Gleiser, C. A., 761, 1554, 2211, 3404, 3405.
Glenister, T. W., 3983.
Glenn, M. W., 2127, 3545.
Glover, P. E., 872.
Glover, T. D., 3025.
Glushkova, N. A., 2971.
Gmitter, J., 480, 2802, 2913.
Gnesh, G. M., 1663.
Gochenour, W. S., Jr., 3691.
G-Ochoa Juanes, J., 770.
Godglück, G., 1547, 2538, 2780.
Goding, J. R., 2417.
Göbel, F., 1863.
Goeffon, Y., 1624.
Goerttler, V., 3353.
Goethe, H., 760.
Goetsch, D. D., 2977, 3877.
Goetz, R. H., 1417.
Götze, R., 37, 57, 1336, 2654, 3220, 3221, 3222.
Gőzsy, B., 3081.
Gogoașă, V., 2187, 2329.
Goguillot, T., 378.
Goldberg, A., 2640.
Goldberg, H. S., 2214.
Goldhaft, T. M., 3458.
Goldie, W., 3692.
Golding, N. K., 3066.
Goldman, B., 477.
Goldmann, G., 2887.
Gołębiowski, S., 1150.
Gomberg, H. J., 2342.
Gomes, J. F., 363.
Gomez, C., 1230.
Gómez Cárdenas, G., 1034.
Gómez López, L., 2553.
Gonharov, A. F., 1901.
Gonzalez Romero, V., 1211.
Good, R. A., 2916.
Goodall, R. R., 3463.
Goode, E. R., Jr., 1157.
Gooding, C. D., 2134, 3299.
Goodwin, K., 1819.
Goodwin, R. F. W., 1752, 2720, 2919, 3512.
Goodwin, W. J., 2922, 3516, 3836.
Gopalakrishnan, K., 732.
Goranoff, G. I., 2189.
Gordeuk, S., Jr., 1528.
Gordienko, L. F., 1133.
Gordon, E. D., 436.
Gordon, H. A., 2363.
Gordon, H. McL., 149, 3208.
Gordon, I., 1663.
Gordon, J., 863.
Gordon R. F., 2131.
Gordon, R. S., 2036.
Gordon, W. A. M., 1464.
Gordon, W. S., 185, 186.
Góreczny, E., 2520.
Goret, P., 2624, 2907, 2910, 3362, 3688, 3808.
Gorham, J. R., 136, 481, 839, 1975, 3243.
Gortsevski, S. A., 2386.
Goss, H., 994.
Gotink, W. M., 1045.
Gouge, H. E., 357, 2181, 2182.
Gould, J. C., 672.
Gould, R. G., 1009.
Gould, S. E., 2342.
Gourdon, J.-M., 925.
Gourdon, R., 925.
Govorov, A. M., 3351, 3352.
Gowdey, C. W., 587.
Goyco, J. A., 2959.
Grabar, P., 3327.
Graber, E. R., 3843.
Graber, M., 3523, 3855.
Da Graça, H. M., 2232, 2266, 3762.
Grachev, V. N., 1491.
Graf, G. C., 2953.
Graf, R., 3676.
Graham, A. J., 868.
Graham, M. A., 270.
Grainger, R. M., 1957, 2556.
Grand, C. G., 2355.
Granett, P., 870, 871.
Granger, W., 284.
Granoff, A., 1987.
Grant, P. T., 419.
Granville, A., 3199.
Grashuis, J., 922, 3303.
Grassé, P.-P., 3053, page 360.
Gray, D. F., 1855.
Gray, D. M., 1485.
Gray, F. V., 3886.
Gray, I., 608.
Gray, M. L., 3369.
Gray, R. L., 3165.
Gray, S. T. G., 3854.
Grayson, A. R., 3070.
Greatorex, J. C., 1011.
Greaves, R. I. N., 3326.
Green, D. M., 8.
Green, H. D., 2152.
Green, I., 176, 177.
Green, M. M., 994.
Green, R. J., 3567.
Greenberg, M. S., 604.
Greenhalgh, N., 3464.
Greenstein, J. P., 1074, page 52.
Greganti, F. P., 3282.
Gregoire, C., 1308, 3199.
Gregorovič, V., 881.
Gregory, T. S., 3065.
Greig, J. L., 1837.
Greig, J. Russell, 3658.
Greig, W. A., 2658.
Gressette, F. R., Jr., 2922.

Greuel, E., 373.
Greve, D., 1739.
Griem, W., 2387.
Griffin, C. A., 3878.
Griffiths, D. E., 1523.
Griffiths, E. K., 1706.
Griffiths, R. B., 2011.
van der Grift, J., 3558.
Grigore, C., 408, 409.
Grillo Torrada, J. M., 3452.
Grimbergen, A. H. M., 1023.
Grimes, E. F., 1450.
Grimes, J. E., 818.
Grocott, R. G., 405.
Grodde, S., 3686.
Groeger, R., 1109.
Grönfoft, O., 574.
de Groot, T., 1045.
Grootenhuis, G., 2984.
Gross, R. 256.
Grosso, E., 3084.
Grosvenor, C. E., 2425
Groth, A. H., Jr., 1459.
Groulade, P., 3142.
Groupé, V., 2622, 3946.
Groves, F., 2230.
Groves, H. F., 1918.
de Gruchy, P. H. 961.
Gruest, J., 2864.
Grummer, R. H., 294, 1342, 2041.
Grund, S., 3091.
Grundboeck, M., 92.
Grunert, E., 1812.
Grunsell, C. S., 919.
Grycz, E., 2793.
Gualandi, G. L., 733.
Guarini, G., 2869, 2870, 2871, 2873.
Gubler, C. J., 1359, 2367, 3559, 3561.
Gudkin, A. F., 3037.
Güley, M., 2598.
Günther, O., 2796.
Günther, S., 637, 638, 639.
Günzler, O., 787.
Gürtler, H., 1418.
Guida, V. O., 3673 3726.
Guilhon, J., 2666, 2707, 2709.
Guillaumie, M., 1174.
Guilleret, J., 704.
Guislain, P., 2582.
Gul'ev, P. K., 2378.
Gunter, J. J., 1486.
Gusev, V. F., 3136.
Gustafson, B. A., 3340.
Gustafson, D. P., 2885.
Guthrie, J. E., 3212.
Gutierrez, J., 81.
Gutsch-Weiss, E., 1576.
Guttman, A. A., 1490.
Guyton, A. C., 3282.
Guzman, M., 2052.
Guzman, M. A., 3374.
Guzzonato, G., 2444, 3033.
Gwatkin, R., 223, 952.
Gylstorff, 842.

Haag, J., 1498, 2303, 3164.
Haas, K. B., 590.
Haas, V. H., 116, 3815.
Habel, K., 3774, 3775.
Habermann, R. T., 2305.
Habura, D., 3952.
Hackenthal, H., 2272.
Haddow, A. 1074, page 52.
Haddow, A. J., 1988.
Hadek, R. 1419.
Hadlow, W. J., 1450.
Hadorn, E. 3054.
Haelterman, E. O., 2461.
Hämmäinen, T., 729.
Hafez, E. S. E., 1816, 2098, 3031.
Hafs, H. D., 1429.
Haig, D. A., 97, 2897.
Haikonen, M., 261.
Haïs I. M. 3169.
Hajsig, M., 2570.
Halama, A. K., 1006.
Hale, F., 2944.
Hale H. H., 1794, 3062.
Hale, H. P., 999.
Haley, T. J., 963, 2068.
Hall, A. E., 517.
Hall, C. E., 1062, 2048.
Hall, L. W., 1783.
Hall, R., 2227.
Hall V. E., 1841.
Hall, W. J., 1136.
Hall, W. T. K., 808.
Hallgren, W., 936, 1734, 3917.
Halliday, R., 3825, 3826.
Halloran, P. O'C., 1373.
Hallpike, C. S., 3993.
Halnan, E. T., 515.
Hamada, S., 375.
Hamakawa I., 789, 790.
Hamilton, A. Y., 3125.
Hamilton, G. M., 1120.
Hamilton-Dick, G., 970.
Hammar, A. H., 3498.
Hammer, D., 3, 680., 681, 1905, 3661.
Hammer, R., 3613.
Hammon, W. McD., 3780.
Hammond, D. M., 1922, 2575.
Hammond, J. 3317.
Hammond, R. A., 1833.
Hammond, W. H., 1469
Hamre, D., 3814.
Hanasato, T. 2490.
Hancock, J., 212.
Hancock, J. L., 277, 623, 1037, 1432.
Hancock, R. C. G., 1820.
Handler, J. J., 3954.
Hanko, E., 1205.
Hansard, S. L., 203, 654, 2964.
Hansel, W., 292, 1813.
Hansen, H.-J., 2992.
Hansen, M. A., 427.
Hansen, M. F., 1684, 2945.
Hansens, E. J., 870, 2630, 3192.
Hanson, L. E., 1779, 1984.
Hanson, P., 129.
Hanson, R. P., 118, 2316, 2861, 3771.
Harada, F., 2379.
Harada, K., 1965, 2294, 2324, 3175.
Haraszti, E., 239.
Harbord, R. S., 157.
Harbour, H. E., 1301.
Harbourne, J. F., 741.
Harding, H. B., 2328.
Harding, H. P., 2699.
Harding, K. M., 3354.
Harding, W. C., Jr., 1674.
Hardison, W. A., 2953.
Hardy, M. H., 2741.
Harfenist, M., 1688.
Harker, K. W., 1465.
Harkness, M. L. R., 3311, 3312.
Harkness, M. N., 1722.
Harkness, R. D., 3311, 3312, 3313.
Harlow, H. F., 1755.
Harnach, R., 105.
Harouni, B., 1651.
Harrell, W. K., 697.
Harris, D. B., 3302.
Harris, H., 1416.
Harris, J. R., 2046.
Harris, L. E., 2380.
Harris, M., 1523.
Harris, M. E., 1151, 3383.
Harris, T. W., 2705.
Harrison, D. L., 579.
Harrison, G. F., 1348, 1761.
Harrison R. G., 1846, page 246.
Harris-Smith, P. W., 684, 685, 3674.
Harrop, A. E., 279.
Harry, E. G., 1875, 2181, 3304.
Hart, D. S., 1821.
'T Hart, M. L., 2360.
Harthoorn, A. M., 3624.
Hartley, W. J., 1571, 1573, 1574.
Hartman, A. M., 2661.
Hartman, F. W., 478.
Hartman, J. L., 568.
Hartman, R. H., 2039.
Hartsough, G. R., 3412.
Hartwigk, H., 395, 700, 3091.
Harvey, R. A., 1393.
Harvey, R. W. S., 687, 3385.
Hašek, M., 138.
Hashimoto, H., 375.
Hashizume, K., 2791.
Hashmi, Z. A., 69, 120, 466, 514.
Hasnain, H., 120, 466.
Hass, K. B., 244.
Hata, D., 1013.
Hatano, T., 2725.
Hauke, H., 1977.
Hauptman, B., 1513, 3928.
Hauser, M. M., 2665.
Havassy, I., 1010, 3018.
Hawk, H. W., 287.
Hawk, W., 2712.
Hawking, F., 3861.
Hawkins, G. E., Jr., 921.
Hawkins, R. H., 215.
Hawkins, W. W., 1730.
Hawley, G. E., 1098.
Hawley, G. F., 2602.
Hay, G. K., Baron., 1832.
Hayashi, S., 2300.
Hayes, W. J., Jr., 585.
Hayflick, L., 1283.
Hayman, R. H., 1824.
Haynes, F. W., 3286.
Haynes, H. L., 871.
Hays, R. L., 2116.
Hays, V. W., 1710.
Hayward, H. G., 3512.
Hazel, L. N., 3987.
Head, K. W., 19.
Head, M. J., 199.
Healy, M. J. R., 1469.
Heard, D. H., 3512.
Heard, R. D. H., 631.
Heath, H. D., 446.
Hebel, W., 3291.
Hecke, F., 1261, 2981.
Heckly, R. J., 1467.
Heddleston, K. L., 1136.
Hedgecock, L. W., 1507.
Heglin, J., 963.
Hegsted, D. M., 2965.
Heida, J., 521.
Heidelberger, M., 862.
Heikkila, I., 3743.
Heim, E., 1442.
von Hein, D., 347.
Heinemann, F., 2821.
Heinig, A., 2860, 3604.
Heirman, A. L. J. M., 783.
Helbacka, N. V., 2706.
Hellman, B., 3995.
Hellmann, E., 1511, 1853.
Helmboldt, C. F., 1171.
Helvig, R. J., 3060.
Hemkes, O. J., 2636.
Hemmings, W. A., 3827.
Hemsley, L. A., 2809.
Hendershott, R., 836.
Henderson, D. W., 2480, 2539, 3064.
Henderson, G. N., 2031, 3794.
Henderson, W. J. 1393.
Henderson, W. M., 1224.
Hendrik, A., 2890.
Henkin, G., 415.
Henmi, S., 789, 790, 791, 792.
Henry, K. M., 529.
Henry, M., 925.
Hentschl, A. F., 1733.
Henze, S., 760.
Hepler, O. E., 2328.
Hepp, L., 3632.
Herbert, C. N., 2162.
Herbert, D., 3414.
Herbert, T. G. G., 2543.
Herdmann, I., 1760, 3609.
Herin, V., 1210, 1350, 2644, 2645, 2646, 2647.
Herlich, H., 159, 3853, 3857.
Herman, C. M., 2305.
Herman, J. R., 2401.
Hermanek, P., 3931.
Hernandez, H. J., 3571.
Herndon, J. F., 3575.
Herrell, W. E., 3738.
Herrick, C. A., 501, 800, 2243, 3207.
Herrick, E. H., 1046.
Herrick, R. B., 2448.
Herrmann, M., 2662.
Herrnleben, H.-G., 3965.
Hertz, C. S., 2342.
Herzberg, M., 3418.
Hess, E., 747, 1155, 3754.
Hess, W. R., 1943, 2265, 2590.
Heuser, G. F., 2664, 3905.
Hewes, C. G., 2034.
Heywang, B. W., 899, 3881.
Hiatt, C. W., 2211, 3404, 3405.
Hibbs, J. W., 518, 2688.
Hicks, P. K., 2230.
Hiepe, T., 1418, 1867.
Hiestand, W. A., 3636.
Higginbottom, C., 1423.
Hignett, S. L., 892.
Hilbrich, P., 3133.
Hill, B. M., 482, 483.
Hill, C. H., 32, 3851.
Hill, D. H., 1915.
Hill, E. G., 1917.
Hill, H. J., 1453, 1454, 3305.
Hill, K. J., 1800.
Hill, K. R., 3935.
Hill, R., 2669.
Hill, R. W., 128.
Hillarp, N.-A., 2729.
Hillerman, J. P., 308.
Hilsont, P., 1192.
Hintermann, J., 3252.
Hinz, R. W., 837.
Hinze, P. M., 3375.
Hirasawa, K., 2300.
Hirato, K., 824.
Hirch, A., 3364.
Hiregaudar, L. S., 798, 799.
Hirota, E., 1170, 2206.
Hirsch, E. A., 153, 556.
Hirt, G., 1751.
Hirtz, J., 2259, 2260.
Hitchcock, D. J., 431.
Hitchcock, L. F., 1314, 1315.
Hitters, J. G., 3009.
Hiärre, A., 2653.
Hlidar, G. E., 771.
Hnatko, S. I., 2493.
Hoag, W. G., 3789.
Hoare, C. A., 3751.
Hobday, J. H. N., 661.
Hodges, F. A., 3417.
Hodges, H. G., 1094.
Hodgetts, V. E., 3627.
van der Hoeden, J., 1168, 2542.
Hoefer, J. A., 1728, 1729, 2040, 3894.
Höfliger, H., 290.
Högberg, B., 2729.
Höhn, E. O., 2727.
Hoekstra, W. G., 201, 236, 2041.
Höpken, W., 2236.
Hoerlein, A. B., 748, 896.
Hoerlein, B. F., 437.
Hofer, A. S., 2867.
Hofferber, O., 1338.
Hoffman, G. O., 1769.
Hoffman, W. F., 1389.
Hoffmann, G., 2151, page 177.
Hoffmann, J. A., 1711.
Hofmann, W., 2989.
Hoflund, S., 936.
Hofmeyr, C. F. B., 655.
Hogan, D. J., 3959.
Hok, K. A., 3125.
Hokanson, J. F., 3475.
Holbrook, A. A., 3772.
Holdeman, L. V., 3401.
Holden, H. F., 311.
Holden, P., 448.
Hole, N. H., 3361.
Hollaender, A., 1076.
Hollander, A. G., 16.
Hollister, C. J., 2056.
Holló, F., 2943.
Holm, L. W., 3600.
Holm, P., 1603.
Holman, H. H., 676, 945, 1484, 3016.
Holman, W. I. M., 3578.
Holmes, R. L., 3020.
Holmes, T. H., 3358.
Holt, A. F., 3318.
Holtman, D. F., 2192, 3380.
Holz, J., 80, 439, 1676, 2334.
Holz, K., 2888, 3703, 3981.
Holz, W., 3085.
Holzworth, J., 3251.
Homan, N., 3305.
Homeyer, P., 2447.
Hoogendoorn, H., 803.

Hopkins, E. D., 868.
Hoppe, F., 51.
Hoppe, R., 2571.
Hopwood, J. B., 3426.
Horiuchi, T., 1241, 1339, 2996.
Van Horne, R., 1362.
Horner, W. H., 530.
Horney, F. D., 1747.
Horsfall, F., Jr., 2103.
Horsfall, W. R., 1475, page 177.
Hornstein, K., 2862.
Horton-Smith, C., 1926, 3429 3533.
Hough, W. H., 1813.
Houpt, T. R., 253, 3012.
Hove, E. L., 3575.
Hovorka, J., page 602.
Howarth, L., 1691.
Howarth, J. A., 3245.
Howell, D. G., 6, 676, 1484.
Howie, J. W., 2757, page 177.
Hoy, J., 2007.
Hraba, T., 138.
Hrudka, F., 1575.
Huang, T. C., 242.
Huard, P., 1624.
Hubbard, E. D., 748.
Hubert, A. A., 1177.
Hubík, R., 461.
Hubrig, T., 1562, 3682.
Hudgins, P. C., 2166.
Hudson, C. B., 448, 3574
Hudson, F., 2443.
Hudson, J. R., 843, 844, 980.
Huff, J. W., 3549.
Huffman, C. F., 1733, 3369, 3895.
Huggett, A. St. G., 914, 915.
Hughes, C. M., 3216.
Hughes, D. L., 2.
Hughes, L. E., 712, 2543.
Hughes, R., 606, 3287.
Hughes, R. E., 1051, 1136.
Hughes, W. H., 3121.
Hulet, C. V., 3969, 3980.
Hull, R., 3464.
Hull, R. N., 2619.
Hulland, T. J., 1747, 1933.
Hume, C. W., 3036.
Hungate, R. E., 1345.
Hungerford, T. G., 3202.
Hunsaker, W. G., 3687.
Hunt, E. L., 2396.
Hunter, F. E., 1973.
Hunter, G. L. 1029.
Hunter, G. W., 873.
Hunter, J. S., 2106.
Hunter, W. M. D., 972.
Hupka, E., 1771, 2398.
Huq, M. M., 22, 35.
Hurst, E. Weston, 2277, 3462, 3464.
Hussel, L., 1954.
Hutcheson, M. K., 2973.
Hutchins, D. R., 557, 935, 2997.
Hutchinson, J. C. D. 2749.
Hutchinson, R. H., 2145.
Hutner, S. H., 1072.
Hutt, F. B., 31, 1819, 2028.
Hutt, M. S. R., 3008.
Hutter, K., 2268.
Huziwara, T., 2777.
Hypes, R. A., 1921.
Hyslop, N. St. G., 1636, 2558, 3745.

Ichikawa, S., 3019.
Iggo, A., 2094.
Ihrig, H. K., 3625.
Iizuka, S., 2996.
Ikeda, M., 429.
Ikegami, T., 3166.
Ileri, S. Z., 3776.
Imabayashi, K.-I., 2725.
Imagawa, D. T., 446.
Imai, N., 1874.
Imaizumi, K., 2155.
Inaba, Y., 2294, 2324, 3175.
Inglis, J. S. S., 918.
Ingram, G. C., 1806.
Ingram, M., 1425, 1806, 2732.
Inkster, I. J., 2460, 3306.
Innes, J. R. M., 166, 2668, 2792, 3813.
Inui, S., 1390.
Ippen, R., 3681.
Irfan, M., 163.
Irikin, V. F., 1455.
Irisawa, J., 2270.
Irons, J. V., 853.
Irving, M. R., 3744.
Irwin, D. H., 2660.
Isenstein, R. S., 3853.
Ishida, K., 291, 1936, 3166.
Ishigami, N., 181.
Ishiguro, H., 2357.
Ishihara, T., 2349, 2350.
Ishii, K., 2270.
Ishii, S., 1965, 2283, 2284, 2294, 2323, 2324, 2718, 3175, 3176.
Ishitani, R., 1241, 1339, 1965, 2299, 2301, 2324, 2996, 3175.
Israil, M., 30, 1100.
Itikawa, O., 1241, 1341, 2874, 2996.
Ito, K., 695.
Ittner, N. R., 1800.
Ivanov, A., 3155.
Ivanov, A. D., 3147.
Ivanov, B. G., 1880, 2531.
Ivanov, M. M., 1555, 3511.
Iványovics, G., 816, 1946, 1949.
Ivashkin, V. M. 2946.
Ivens, V., 2343.
Ivins, J. D., 900.
Iwanaga, T., 1874.
Iwanoff, N., 3034.
Iwanoff, X., 1019.
Iwata, A., 789, 790, 791, 792, 794, 795, 1182, 1183, 2219.
Iyer, P. R. K., 3100.
Iyer, S. V., 827.
Izumi, K., 1874.

Jackson, C. H. N., 872, 1583, 1669.
Jackson, J. H., 2077.
Jackson, J. J., 2477.
Jackson, J. T., 541.
Jaclot, P., 2666.
Jacobs, L., 435.
Jacobs, R. E., 1171.
Jacobsen, E. M., 964.
Jadin, J., 133, 1287.
Jaffé, W. G., 3577.
Jahn, U., 313.
Jahnel, J., 1026.
Jahnes, W., 761, 1554.
Jakucewicz, S., 1628.
James, F., 2457.
Jamieson, W. M., 8.
Jamil, M., 69, 94.
Janovsky, M., 2424.
Janowski, H., 52, 728, 1750, 2222, 2784.
Jansen, B. C., 1911, 2855, 2856.
Jansen, J., 855, 947, 1127.
Jacotot, H., 113, 464, 1639, 1642, 1643, 2199, 2307, 2512, 3729.
Jarnum, S. A., 253, 3012.
Jaroslow, B. N., 2929.
Jarrett, I. G., 190, 2402.
Jarrett, W. F. H., 1324, 2346, 3866.
Jaśkowski, L., 71, 2571.
Jasmin, A. M., 3409.
Jasper, D. E., 1248.
Jastrzebski, T., 3030.
Jay, G. E., Jr., 1450.
Jebson, J. L., 1571, 1573.
Jelesić, G., 1948.
Jelesić, R., 1947.
Jelesić, Z., 1948, 3773.
Jellard, C. H., 2434.
Jellinck, P. H., 631.
Jellison, W. L., 1879, 3123.
Jenney, E. W., 3772.
Jennings, F. W., 150, 918.
Jennings, P. A., 1855.
Jensen, L. S., 2958, 3592, 3905.
Jensen, R., 3261, 3470.
Jensen, R. G., 3749.
Jensen, W. L., 767.
Jensen, W. N., 2038, 2968.
Jephcott, B. R., 2962.
Jerstad, A. C., 21.
Jester, W. R., 2958.
Jiřina, K., 941.
Jørgensen, S. K., 1044, 3982.
Johansson, K. R., 187.
Johari, M. P., 2440.
Johns, E. E., 21.
Johnson, A. E., 1922, 2575.
Johnson, A. S., 3982.
Johnson, D. F., 907.
Johnson, E. L., 193, 238, 2706.
Johnson, E. P., 1207, 2237, 3495.
Johnson, J. B., 2001.
Johnson, R. B., 938.
Johnson, R. E., 1414, 1794, 1795.
Johnson, T. K., 504.
Johnson, W. J., 1365.
Johnson, W. P., 357, 1102, 1281.
Johnston, E. F., 2443, 3524.
Johnston, K. G., 400, 2831.
Johnston, P. M., 2087.
Johnston, R. L., 1728.
Johnston, R. V., 3802.
Johnstone, F. R. C., 3953.
Johri, L. N., 3198.
Jolly, D. W., 156.
Jondet, R., 1036.
Jones, C. H., 523.
Jones, C. M., 2631.
Jones, E. W., 3901.
Jones, I. C., 2471, 2761, page 360.
Jones, J. D., 1347.
Jones, L., 1878.
Jones, L. D., 3587.
Jones, M. H., 446.
Jones, R. F., 356.
Jordan, F. T. W., 243, 567, 3748.
Jordan, J., 1270.
Jordan, R. T., 2326.
Jordan, W. J., 608.
Jordanov, S., 241.
Joubert, D. M., 519.
Joubert, L., 3362, 3688.
Jove, J. A., 3847.
Joyce, J. M., 2359.
Joyner, C., 2633.
Joyner, L. P., 1775, 1927, 2244, 2853, 3757.
Józefów, W., 3928.
Jubb, K. V., 1020, 3908.
Judah, J. D., 3896.
Judd, J. M., 1415, 2240.
Juhler, H., 2454.
Jukes, T. H., 2760, page 410.
Julian, L. M., 1694.
Jungherr, E., 3818.
Jungherr, E. L., 1171, 1209, 1838, 2043, 2044, 3423, 3906, page 246.
Juszkiewicz, T., 1402.

Kabat, E. A., 3832.
Kachakhidze, A. V., 3583.
Kadenatsi, A. N., 2948.
Kadziołka, A., 838.
Kaeckenbeeck, A., 1161, 1657, 1862.
Kaemmerer, K., 3014, 3629.
Kästli, P., 1533.
Kafel, S., 3709.
Kaffka, A., 2158.
Kagan, B. M., 1723.
Kagan, I. G., 493.
Kahn, J., 3310.
Kaipainen, W. J., 1553.
Kaiser, E., 1723.
Kakavas, J. C., 2186.
Kakhadze, M. Y., 3584.
Kakutani, S., 2357.
Kalbe, I., 1328.
Kalbe, L., 2942.
Kallings, L. O., 1520.
Kalter, S. S., 2894.
Kametaka, M., 2725.
Kamimura, T., 1874.
Kamocsay, D., 998.
Kampelmacher, E. H., 2479.
Kanawyer, W. L., 1978.
Kane, G. J., 1569.
Kanning, H. H., 1043.
Kaplan, M. M., 1635, 3775.
Kaplan, W. 1238.
Kapustin, V. F., 2758.
Karakašević, B., 1549.
Karczewski, W., 472, 1277, 2310.
Karellová, J., 2790.
Karg, H., 1791.
Karl, H., 286.
Karle, L., 705, 3761.
Karmann, P., 3717.
Karpeev, S. A., 2947.
Karras, W., 280.
Karstad, L. H., 3771.
Karsten, 2803.
Karvounaris, P. A., 612.
Kaschula, V. R., 2290.
Kassai, T., 884.
Kasza, L., 1551.
Katasheva, Y. E., 3531.
Katić, R. V., 2812, 3411.
Kato, K., 2300.
Kátó, L., 3081.
Katz, E., 2898.
Kauffmann, F., 3701.
Kaufman, N., 1647.
Kauker, E., 474, 1566, 3174, 3792.
Kawada, S., 2350.
Kawakami, Y., 1965, 1966, 2276, 2323, 3176.
Kawanishi, Y., 1113, 2174.
Kawashima, H., 1170, 1182, 1183, 1390, 2206, 2219.
Kawata, K., 93.
Kawata, S., 2349.
Kaweh, M., 95.
Kay, S., 1665.
Kazanski, S. I., 2940.
Kean, B. H., 425.
Keast, J. C., 1884, 3621.
Kedrov, V. K., 618.
Keidel, H. J. W., 802.
Keiding, J., 3839.
Keiss, R. W., 2626.
Kelin, M., 1958.
Keller, W., 1271.
Kelley, G. W., 2347.
Kelly, C. F., 1809.
Kelly, J. W., 82.
Kelly, W. R., 3945.
Kemenes, F., 348, 757, 758, 1551, 2548.
Kemmerer, A. R., 3881.
Kemp, A., 2360.
Kempe, L. L., 2826.
Kendall, S. B., 1216, 1927, 2244, 2853.
Kendrick, J. W., 2603, 3103, 3389, 3469.
Kennedy, P. C., 2838.
Kenny, J. E., 146.
Keppie, J., 336, 684, 685.
Kercher, C. J., 1716.
Kernkamp, H. C. H., 1043.
Kerr, W. R., 3510, 3755.
Kerruish, B. M., 1810.
Kerruish, D. W., 3927.
Kershaw, W. E., 165.
Kersten, H. E., 2483.
Kersten, W., 1545.
Kertay (Kerbler), N., 1496.
Kessler, H., 3966.
Kesztyüs, L., 1296, 1297, 1298.
Kett, F. J. L., 858.
Kettle, D. S., 145.
Kettner, H., 3119.
Ketz, A., 343, 374.
Ketz, H.-A., 2428.
Van Keulen, A., 1872.
Keuning, F. J., 2915.
de Keyser, J., 2179.
Khalvashi, O. S., 3568.
Khan, A. A., 69.
Khatin, M. G., 1673, 2004.
Kibler, H. H., 1014, 3274.
Kieser, J., 210.
Kiggins, E. M., 1561.
Kikinis-Jelesić, R., 1948.
Kikkawa, H., 255.
Kilchsperger, G., 2384.
Kilham, L., 2305, 3482.
Kilpatrick, J. W., 2335.
Kimeldorf, D. J., 964, 2396.
Kind, L. S., 3513.
Kindler, M., 2000.
King, D. F., 2063.
King, E. S. J., 2115.
King, J. O. L., 602, 1788, 3585, 3961.
King, J. T., 1356, 3570.

Kingrey, B. W., 1743.
Kingsbury, P. A., 156, 879.
Kinsella, P. C., 1508.
Kipps, A., 2604.
Kirby, N. G., 2075.
Kirchner, C., 3373.
Kirk, R., 2569.
Kirschner, L., 2212.
Kirsh, D., 16.
Kishi, S., 2285, 2286.
Kissling, R. E., 1956, 2592, 3460, 3461, 3775, 3819.
Kissmeyer-Nielsen, F., 2551.
Kitaevich, E. I., 2607.
Kitay, J. I., 1843.
Kitchell, R. L., 3630.
Kitching, J. A, 2150
Kitts W. D., 2419, 2420.
Kiuch, J., 2286.
Klastrup, N. O., 2473.
Kleckner, M. D., 2343.
Kleiber, M., 1413, 2421, 2422.
Kleissner, M., 1699.
Klesov, M. D., 3521.
Klette, H., 520, 1449.
Kliewer, I. O., 3140.
Klimeš, B., 508.
Klintworth, H., 210.
Klock, J. W., 3848.
Klöppel, G., 1644.
Kluge, E. B., 809.
Kmety, E., 2209.
Knaus, D., 3261.
Knight, G. J., 3127.
Knight, R. P., 274.
Knipling, E. F., 867, 1304, 3188.
Knocker, P., 607.
Knoll, M. L., 2556.
Knoth, 727.
Knowles, J. R., 2559.
Knowles, N. R., 2130.
Knox, R., 341.
Knudsen, O., 2449.
Kober, U., 2895.
Kobusiewicz, T., 82.
Koch, E., 3350.
Koch, H., 1308.
Koch, J. H., 209.
Koch, P., 1458.
Koch, W., 1442, 3035.
Köhler, H., 543, 3588, 3865.
Köhler, W., 2770.
Köppe, A., 3247.
Környei, I., 1941.
Köser, A., 345.
Kösslinger, E., 1853.
Kötsche, W., 112, 3145, 3487.
van Koetsveld. E. E., 922.
Koger, L. M., 3619.
Koger, R. B., 1780.
Kohn, A., 122.
Koike, T., 93.
Kokovin, I. L., 1888.
Kolb, E., 1004, 1792, 1793, 2552.
Kolesov, S. G., 1490, 1491, 1848.
Kolesova A. I., 1539.
Koller, M., 1296, 1297.
Koller, R., 183.
Kollmann, O., 346.
Kolochine-Erber, 754, 2806.
Kolomiets, Y. S., 1309.
Kolsky, M., 2082.
Komarov, A., 2862, 3775.
Kon, S. K., 529, 926, 1348.
Konikov, A. P., 683.
Konishi, S., 3166.
Kopp, C., 705.
Koppel, Z., 1575.
Koprowski, H., 1229, 1230. 1231, 1232, 3775.
von Korff, R., 1295.
Korn, G., 442.
Kornienko, Z. P., 2250.
Kornilova, A. L., 2216.
Koroleva, V. P., 2758.
Kosel, G., 2070.
Koshi, J. H., 601.
Košlak, A., 2789.
Kostyaeva, A. A., 1532.
Kotlán, A., 1929.
Kotlán, S., 884.
Kotter, L., 3704.
Koutz, F. R., 1918.
Kovács, F., 239.
Kovács, J., 1400.
Kovalenko, J. R., 3797.
Kovalenko, Y. R., 857.
Kozeff, A., 2043, 2044.
Kozlovski, E. V., 2850.
Kozłowska, J., 496.
Kozłowski, F., 2533.
Koznov, N. A., 1592.
Krabbe, A., 1635.
Krahnert, R., 512.
Kral, F., 1907.
Král, J., 1146.
Kralj, M., 2435.
Kraneveld, F. C., 803, 804.
Krastin, N. I., 3534.
Kratzer, F. H., 526, 3907.
Kraus, H., 224.
Krause, A. C., 438.
Krause, D., 708, 1123, 1140.
Krauss, S., 3781.
Krauss, W. C., 3665.
Krčméry, V., 2805.
Kréguer, A., 1174.
Kreis, H. A., 890.
Krenn, E., 714, 3685.
Kretzschmar, C., 109, 1266, 3900.
Kreuz, G., 394.
Krölling, O., 328.
Krohn, A., 1169.
Krohn, A. F., 3849.
Krook, L., 2023.
Krošlák, V., 2904.
Krueger, H., 3015.
Krüger, W., 196, 535.
Krnilova, N. A., 2716.
Kubica, G. P., 1857.
Kubin, G., 218, 2053.
Kuchel, R. E., 3620.
Kucsera, G., 2183.
Kudo, R. R., 782.
Kühn, W., 1760.
Kuhlmann, W., 2730.
Kuhn, U. S. G., 775.
Kuida, H., 3286.
Kujumgiev, I., 781, 2223.
Kujumgiev, J., 1289.
Kulasiri, C., 878, 2635.
Kulesko, I. I., 3477, 3478.
Kulkarni, H. V., 874.
Kuil, K.-E., 389.
Kummer, M., 3162.
Kunst, H., 947. 1278.
Kuntz, R. E., 494.
Kupkin, S. A., 736.
Kuprowski, M., 1215, 2824.
Kurancowa, Z., 380.
Kurata, K., 2283, 2284.
Kurchikov, A. M., 1305.
Kurek, C., 1630, 1750.
Kurilov, N. V., 1799.
Kurimoto, U., 2596.
Kurosaki, T., 553.
Kurtpinar, H., 2337.
Kushina, L. K., 1532.
Kushwaha, N. S., 3307.
Kutleša, I., 2775.
Kuzmin, A. F., 2589.
Kvashnina, E. S., 2758.

Labzoffsky, N. A., 1850, 1057.
Lack, C. H., 3080, 3355.
Lacour, P., 301.
Lacroze, R., 2566.
Ladewig, P. P., 1921.
Lafenêtre, H., 2537.
Lafortune, J.-G., 3582.
Lagerborg, D. L., 447.
Lagerlöf, N., 276, 769.
Lagneau, F., 3310.
Laing, A. D. M. G., 2485.
Laing, C. M., 1095, 3341.
Laing, J. A., 3316.
Lainson, R., 2251, 3439.
Lall, J. M., 1871.
Lamanna, C., 767.
Lamarche, M., 2967.
LaMaster, J. P., 3733.
Lamb, J. H., 2230.
Lambourne, L. J., 2988.
Lambrechts, M. C., 2161.
Lamensans, A., 1997.
Lammers, H., 1735.
Lamoreux, W. F., 1616.
Lamport, H., 605.
Lamson, B. G., 570.
Landers, E. J., 3840.
Landquist, J. K., 3120.
Landram, J. F., 2642.
Landy, M., 3185.
Lane, J. J., 569, 3265.
Lane, J. J., Jr., 3358.
Lannek, N., 107, 1972, 3163, 3805.
Lanz, H., 3562.
Lapage, G., 3048, page 360.
Lapčević, E., 978, 1894.
Lapolla, L., 3863.
Larin, N. M., 463, 1265, 2613.
Laroche, M., 3812.
Larrabee, M. G., 1606.
Larrow, L. L., 2840.
Larsen, A. B., 3687.
Larsen, A. E., 766.
Larsen, N. B., 566.
Larsen, P. L., 214.
Larski, Z., 454, 455.
Larson, C. L., 3182.
Larson, E. J., 3860.
Larson, G. L., 1030.
Larson, L. L., 3630.
Larson, N. L., 1917.
Larsson, B., 2651.
Larsson, E. L., 2698.
Larthe, K., 1021.
Lassiter, C. A., 1700, 3369.
László, I., 1826.
Lauder, I. M., 918.
Lauer, 1565.
Lauffer, M. A., 323, 1288.
Laurain, A. R., 2210.
Laurance, B., 821.
Laurie-Rhodes, L. J., 850.
Lavocat, R., 3053, page 360.
Lavoipierre, M. M. J., 165.
Lavrentev, P. A., 2239.
Law, N. H., 3959.
Lawrence, D. A., 1217.
Lawrence, J. H., 1066, 4009, page 508.
Lawrence, J. J., 1938, 2811.
Lawrence, W. E., 3088.
Lax, L. C., 2963.
Láznička, F., 411, 412.
Lazuga, K., 3720.
Lea, D. E., 2137.
Lebduška, J., 1327.
Lebeda, M., 1555.
Lebek, G., 693.
Lecce, J. G., 413, 1283.
Leduc, E. H., 484, 485.
Lee, D. H. K., 640.
Lee, H. J., 2674, 3620.
Lee, J. M., 3344.
Lee, R. P., 428.
Leech, F. B., 1439.
Leemann, W., 3796.
Legait, H., 1018.
Legenhausen, D. H., 1136.
Legg, J., 2633, 3003, 3191.
Lehnert, E., 2872.
Lehr, J. J., 922.
Leidl, W., 1188.
Leighton, J. W., 3300.
Leite Velho, E. F., 2266.
Leith, T. S., 748.
Leitner, J., 846.
Leka, D., 3179.
Lekveishvili, N. S., 3372.
Leland, S. E., Jr., 160, 503.
Lelutiu, C., 1541, 1542.
Lembke, A., 3107, 3108.
Lemétayer, E., 1893.
Lennette, E. H., 3780.
Lenz-Doroschkin, I., 3285.
León, A. P., 740.
Leon, M. A., 862.
Leonard, L., 60.
Leonard, R. O., 1763.
Leone, E., 3023.
Lépine, P., 3775.
Lesher, S., 1695, 2132.
Lettow, E., 537.
Lev, M., 2355.
Levaditi, J., 7, 2215.
Levashov, A. A., 1240.
Levi, A. A., 3120.
Levine, L., 1188.
Levine, N. D., 424, 2343.
Levine, P., 1008.
Levine, P. P., 1286.
Lewis, C., 3266.
Lewis, D., 527.
Lewis, D. J., 3841.
Lewis, E. F., 2071.
Lewis, F. A., 1124.
Lewis, H. E., 154.
Lewis, I., 3937.
Lewis, P. K., Jr., 2041.
Li, P. N., 2578.
Libby, D. A., 188.
Libenson, L., 649.
Liberatori, J., 2870, 2871, 2873.
Li Choh Hoo, 1414.
Lieberman, J., 3960.
Liebisch, H., 714, 3685.
Lienert, E., 1471.
Likar, I. N., 3973.
Likhachev, N. V., 2594.
Lillevik, H. A., 160.
Lilly, H. A., 762.
Lindblad, G. S., 3637.
Linder, A., 2290.
Lindgren, N. O., 26.
Lindner, H. R., 2085.
Lindquist, A. W., 869, 1304.
Lindquist, B., 3898.
Lindquist, W. D., 160.
Lindqvist, K., 1184, 1900, 2832.
Lindsay, S., 228, 524, 3970.
Lindstrom, E. S., 3475.
Ling Sun Chu, 2173.
Link, R. P., 304, 3551.
Linkous, W. N., 245, 2933, 2953.
Linsert, H., 3694.
Linssen, H., 1141.
Linton, A. H., 3739.
Linzell, J. L., 265.
Lipanowicz, J., 3074.
Lipnicki, J., 1156.
Lipp, R., 2796.
Lippelt, H., 2322.
Lips, M., 432.
Lison, R., 1073.
Lissot, G., 3492.
Litalien, F., 152.
Little, J. M., 272.
Littlejohn, A. I., 55.
Liu, C. H., 1710, 2972.
Livoni, P., 2153.
Lochmann, E.-H., 2433.
Lockart, L. W., 1462.
Löliger, H. C., 588, 958, 1873, 3128.
Loewi, G., 929.
Lofgreen, G. P., 2422.
LoGrippo, G. A., 478.
Logue, J. T., 2214.
Lohrengel, F., 3141.
Lohwag, K., 1772.
Lok, B., 2479.
Lokhorst, W., 1058.
Lokteva, F. P., 2522.
Lombardo, N., 558, 1035.
Lominski, I., 2779.
London, E., 247.
Long, D. A., 2492.
Long, P. L., 1926, 3429, 3533.
Loosli, C. G., 3814.
Loosli, J. K., page 508.
López Herrera, C., 2069.
Lorber, M. G., 393.
Lorkiewicz, Z., 838.
Lostroh, A., 986.
Lotmar, R., 3278.
Lotz, W. E., 2703.
Loutit, J. F., 1828.
Love, R., 1648.
Lovelock, J. E., 273.
Lovemore, D. F., 1670.
Loving, C., 944.
Low, D. G., 3404, 3405.
Lowbury, E. J. L., 762.
Lowry, D. C., 1615.
de Luca, H. F., 206.
Lucas, A., 925, 3812.
Lucas, A. M., 2136.
Lucas, D. R., 2126.
Lucas, I. A. M., 1353, 1702, 1706.
Lucio Benedetti, E., 3973.
Luck, J. M., 4008, page 602.
Lucker, J. T., 2014, 3211.
Luckey, T. D., 2363.
Ludvigsen, J., 1703, 1704, 1731.

Luecke, R. W., 1728, 1729, 2040, 3894.
Luedke, A. J., 3788.
Lührs, E., 1392.
Luginbuhl, R. E., 3423, 3818.
Luick, J., 1413.
Luick, J. R., 2421.
Lukačević, J., 127.
Luke, D., 1464.
Lulić, V., 1253, 1254.
Lund, E. E., 1925.
Lundgren, B. F., 276.
Lungu, V., 1588.
Lurie, M. B., 702.
Lutyński, R., 2532.
Lutyński, W., 3298.
Lwoff, A., 1072.
Lyaushkin, A. V., 1891.
Lynn, J. W., Jr., 134.
Lyons, W. R., 1414.
Lyubashenko, S. Y., 1880.

Maag, D. D., 3262.
Maaløe, O., 2271.
Mabon, R. M., 2415.
McAdams, A. J., 3813.
MacAlpin, R. N., 986.
McBee, J. A., 1265.
McCall, J. T., 203.
MacCallum, F. O., 1994.
McCance, R. A., 522.
McCarroll, P. J., 971.
McCay, C. M., 242.
McClain, M. E., 1945.
McClary, C. F., 2463.
McClelland, T. G., 709.
McClure, T. J., 1573.
McClurkin, A. W., 118.
McClymont, G. L., 213, 898, 932, 933, 1364, 1732, 2033, 2969, 2976, 3580.
McColl, J. D., 1365.
McCollum, W. H., 1275, 1621, 2281, 2876, 2878.
McConnell, J. D., 3260.
McCord, W. M., 864.
McCormick, W. G., 2068.
McCown, J., 2584.
McCown, J. M., 3442.
McCoy, E. F., 3412.
McCoy, J. R., 2652.
McCulloh, E., 963.
McCulloh, E. F., 2068.
McDiarmid, A., 3076.
MacDiarmid, H. J., 3306.
MacDonald, A. D., 3384.
McDonald, F. F., 247, 534.
McDonald, I. R., 3564.
MacDonald, J. B., 2556.
MacDonald, M. A., 3015.
McDonald, M. W., 898, 3323.
McDonald, N. R., 2154.
McDowell, R. E., 640.
McDuffie, F. C., 3832
McDuffie, W. C., 3188.
McEntee, K., 1020, 2430.
McEntegart, M. G., 2846.
McErlean, B. A., 973, 2814.
McEwen, A. D., 39.
McFadzean, J. A., 2019.
McFarland, C., 3505.
McFarland, W., 312.
McFarlane, D., 1571, 1573.
MacFarlane, I. S., 97.
Macfarlane, M. G., 763.
MacFarlane, R. G., 1457.
McGill, R. F., 2073.
McGillivray, W. A., 926.
McGinnis, J., 2958, 3592.
McGirr, J. L., 3941.
McGowan, B., 2837, 2838, 3159.
McGowan, B., Jr., 98, 99, 3880.
McGrath, H., 2965.
McGrath, J. T., 2468, page 360.
McGregor, W. S., 2628.
McGuire, W. C., 2573.
Mach, P., 2991.
Machado, A. V., 1858.
Machado, L. P., 3387.
Machado, L. J. P., 3388.
Machin, A. F., 3195.
Machlin, L. J., 541.
Mačička, O., 2927.
McIlroy, A. P., 649.
McIntosh, B. M., 1962.
MacIntosh, R., 1060.
McIntyre, G. A., 3488, 3490.
McIntyre, R. W., 2205.
McIntyre, W. I. M., 1324, 2346.
Mack, W. N., 1981, 2315.
McKay, W. M., 2062.
McKelvie, D. H., 3129.
McKenzie, F. F., 2443.
Mackenzie, R. E., 2939.
McKeown, T., 3013.
McKercher, D. G., 98, 99, 1248, 2603, 2879, 3159, 3469.
Mackinney, G., 4008, page 602.
McKinney, R., 3723.
Mackowiak, C., 2259.
McLean, D. M., 2911.
McLean, S. J., 2555.
MacLennan, K. J. R., 1834.
MacLeod, A. K., 3647.
MacMahon, B., 3013.
McMeekan, C. P., 2405.
McNaught, M. L., 525.
McNaulty, N., 2328.
McNuttt, S. H., 1976, 3398.
Macpherson, C. R., 3897.
MacPherson, L. W., 3168, 3486, 3494, 3524.
Macpherson, R., 1263.
McRoberts, D. E., 2370, 3903.
McSherry, B. J., 23, 1746.
McWhorter, A. C., 3702.
Madden, S. C., 570.
Maddock, C. L., 1363.
Madet, P., 1546.
Madin, S., 1945.
Madin, S. H., 1632.
Madlener, E. M., 2556.
Madsen, K. F., 3553.
Madsen, L. L., 2380.
Madsen, T. I., 1251.
Maestrone, G., 2799.
Magath, T. B., 1320.
Maglajlić, E., 195.
Magnusson, A.-M., 3975.
Magrane, W. G., 1388.
Maguire, T., 2212.
Mahadevan, V., 917.
Mahaffey, L. W., 44, 2535, 2536.
Mahoney, J. P., 1359, 3559.
Mahoney, M., 2190.
Mahrla, A., 1138.
Maiboroda, A. A., 3392, 3393.
Mainardi, B., 2680.
Mair, N. S., 1876.
Majewska, H., 2905.
Makari, J. G., 1335.
Makino, S., 633.
Malakatis, G. M., 494.
Malan, J. R., 3241.
Malanga, C. M., 1591.
Malcolm, D. F., 1095.
Malcolm, J. F., 3341.
Malherbe, H., 210.
Malherbe, Y. L., 233.
Maliandi, F. P., 3148.
Malwińska, K., 3102.
Malyarets, P. V., 3782.
Malyavin, A. G., 1870.
Mamedov, A. A., 1175.
Mammoli, R., 1369.
de Man, T., 804.
Manca, A., 1866.
Mangan, G. F., 541.
Mangrum, J. F., 796.
Manjrekar, S. L., 1204.
Mann, I., 1463, 2671.
Mann, P. H., 1688.
Mann, S. O., 2254.
Mann, T., 2117, 3023.
Manninger, R., 348, 671, 4005.
Manocchio, L., 2830.
Mansi, W., 462, 843, 844, 1265, 2612.
Mansur Guérios, M. F., 1726.
Manthei, C. A., 1157.
Mantovani, G., 1679.
Maqsood, M., 3919.
Marański, C., 3187.
Maraud, R., 1817, 1818.
Marberger, E., 628.
Marcey, E. A., 58.
March, R. B., 3189.
Marchisio, M., 1586.
Marcon, C., 3362.
Marcus, S., 1466.
Marczewski, H., 1770.
Marek, K., 928.
Marggraff, L., 1547.
Mariakulandai, A., 1762.
Mariappa, D., 995.
Marić, I., 2775.
Markham, F. S., 3498.
Markovic, B., 2441.
Markowitz, J., 3320.
Markowski, A., 2571, 2844.
Markson, L. M., 3227, 3264.
Markwardt, H., 3930.
Marmion, B. P., 858, 859, 1656, 1658.
Marquardt, W. C., 424, 3856.
Marr, A., 544.
Marr, T. G., 3554.
Marsh, B. B., 3959.
Marsh, C. L., 2787, 3603.
Marsh, H., 200, 2815, 3569.
Marshak, R. R., 242, 3259.
Marshall, C. E., 3299.
Marshall, I. D., 845, 1641.
Martin, A. J. P., 2492.
Martin, L. A., 1267, 2614, 3252, 3808, 3809, 3810.
Martin, L. E., 247.
Martin, M. G., 3573.
Martin, W. B., 436.
Martin, W. H., 609.
Martinčić, M., 3923.
Martínez, M. G., 1581.
Martini, I., 3050.
Martinius, J., 584.
Di Martino, M., 3867.
Martin-Scott, I., 2051.
Martins Mendes, A., 1252, 2232, 2233, 2266, 2295, 3741.
Marton, M., 1913.
Martorano, J. J., 3279.
Marušić, Ž., 2902.
Marx, W., 415.
Marzialetti, G., 2696.
Mascaro, L. A., 1172.
Mason, D. M., 853.
Mason, E. J., 1647.
Masoni, S., 3096.
Masterton, J. P., 154.
Mastronardi, M., 2738, 3867.
Masu, S., 2008.
Mataney, C. F., 3172.
Mather, G. W., 2745.
Mathey, W. J., Jr., 46, 3424.
Mathey, W. R., Jr., 1928.
Mathews, A. G., 1091.
Mathis, M., 75.
Mathois, H., 1471.
Matikashvili, N. V., 3434.
Matloff, J. J., 1502.
Matracia, S., 1522.
Matrone, G., 921, 1451, 2039.
Matsuhashi, A., 1959, 2379.
Matsumoto, H., 2791.
Matsumoto, M., 2276, 2294, 2324.
Matsuzawa, H., 2286.
Mattern, C. F. T., 58.
Matterson, L. D., 2043, 2044, 3572, 3906.
Matthews, J. H., 3571.
Matthews, P. R. J., 5, 6.
Matthey, R., 1073.
Matthias, D., 1242, 1620, 2884, 3154, 3465.
Mattson, W. E., 3611, 3612, 3614, 3615.
Matumoto, M., 1965, 1966, 3175, 3176.
Maubecin, R. A., 3112.
Maurer, P. H., 2625.
Mauvernay, R.-Y., 997.
Mawson, C. A., 1361, 2744.
Mawson, W. F., 3324.
Maxon, M. G., 3189.
Maxted, W. R., 5.
May, A. J., 600, 3287.
May, K. J., 3684.
Maybee, T. K., 1865.
Mayer, H., 983, 1777, 3697.
Mayer, K., page 658.
Mayhew, C. J., 775.
Mayhew, M. W., 2540.
Maynard, L. A., page 508.
Mayr, A., 3454.
Mazzitelli, L., 3181.
Mead, M., page 246.
Medawar, P. B., 3824.
Megale, F., 2430.
Mégret, C., 3698.
Mehring, A. L., Jr., 2410.
Meikle, J. C., 2071.
Meintzer, R. B., 2681.
Meites, J., 3579.
Meldrum, G. K., 3069.
Mellen, W. J., 1754.
Melnikov, M. F., 2971.
Melnykowycz, J., 187.
Melton, M. L., 435.
Melville, E. L., 3321.
Melzack, R., 3325.
Mendel, B., 1411.
Mendes, A. M., 1577.
Menges, R. W., 2827, 3124.
Menkin, V., 2067, 3293.
Menzies, G. C., 818.
Mercier-Parot, L., 1032.
Mercurio, G., 2843.
Merilan, C. P., 3749.
Merkal, R. S., 3687.
Merkt, H., 1470.
Merle, A., 3962.
Merriman, R. W., 3389.
Merrit, H. H., page 658.
Merveille, P., 2269.
du Mesnil du Buisson, F., 283.
Messieri, A., 2776.
Mészáros, J., 814.
Metaxas, M. N., 1499, 2167.
Metaxas-Buehler, M., 1499, 2167.
Metcalf, R. L., 3189.
Metzger, W. I., 776.
Meyer, E., 779.
Meyer, J. H., 916.
Meyer, K., 2263.
Meyer, K. F., 854, 3051.
Meyer, M. E., 3419.
Meyer, T. O., 3648.
Meyn, A., 706, 3348.
Michaelson, S., 962.
Michálek, K, 2904.
Michel, G., 3955.
Michel, J. F., 2939, 3528.
Michel, M., 912, 3229, 3231.
Mieres, A., 3146.
Mierzejewska, M., 1630.
Mierzsejewski, T., 3720.
Mika, 1187.
Mikhailova, I. F., 2531.
Miki, S., 2349, 2350.
Miklanšić, B., 2435.
Miklušičák, R., 3017.
Mikota, L. E., 2107.
Miles, A. A., 1090.
Millar, M. L., 1361.
Millar, P. G., 299, 832, 2737.
Miller, E. R., 1729.
Miller, I. L., 3086.
Miller, J. G., 3438.
Miller, N. J., 221.
Miller, R. F., 1396.
Miller, R. W. R., 663.
Miller, S. J., 1440.
Miller, W. C., 2012.
Miller, W. L., 3267.
Miller, W. R., 1446, 3314.
Millot, P., 143, 1999, 2917, 2918, 3829.
Mills, C. F., 1715, 3234.
Milne, A. H., 576, 2099.
Milne, F. N. J., 1355.
Milunović, M., 2774.
Mimioğlu, M., 2627, 2639.
Mims, C. A., 3160, 3474.
Minaev, I. M., 2714.
Minder, W., 2102.
Minner, J. R., 2619.
Minners, P., 3792.
Mirick, G. S., 1270.
Mitchell, C. A., 3177.
Mitchell, I. W., 533.
Mitchell, J., 433.
Mitchell, K. G., 198, 458, 1701, 1705, 1706.
Mitchell, R. L., 538.
Miteff, G., 2189.
Mitrovic, M., 2519.
Mitscherlich, E., 1249, 1250, 2006, 3728.

Miura, S., 824, 1961.
Mixner, J. P., 3916.
Miyamae, T., 824, 1961.
Miyao, N., 2996.
Mizeres, N. J., 2100.
Mizuno, N. S., 3610.
Mladenoff, Z., 1019.
Moberg, R., 260, 635.
Mochmann, H., 2808, 2865.
Mochrie, R. D., 1794, 1795.
Mócsy, J., 671, 4005.
Möller, A., 2795.
Moeller, A. N., 1434.
Moller, T., 566, 1092.
Mohiyuddeen, S., 889.
Mohler, W. M., 433.
Mohr, C. O., 2804.
Molestina, J. E., 1093.
Molev, E. V., 1331.
Molinari, G., 1586.
Moll, T., 2057, 2058.
Mollgaard, H., 906.
Molnár, I., 834.
Momberg-Jørgensen, H. C., 2583, 2611.
Moncrieff, R. W., 2083.
Mondolfo, H., 3180.
Mondolfo Hounie, E., 3180.
Monin, L., 3812.
Monlux, A. W., 2351.
Monlux, W. S., 2351.
Monnet, C., 1422.
Monreal, G., 3793.
Monroe, R. A., 2703, 3265.
Monsur, K. A., 1923.
Montemagno, F., 2685.
Montgomerie, R. F., 1265.
Montgomery, P. O'B., 1785.
Moodie, E. W., 544, 1720.
Moon, A. P., 873.
Moon, L. E., 1755.
Moore, E. N., 2994.
Moore, J. B., 3985.
Moore, J. H., 1713.
Moore, K. L., 627.
Moore, M., 2554.
Moore, R. W., 229.
Moore, T., 588.
Moore, V., 1187.
Moore, W. W., 966.
Moos, W. S., 1393.
Moosbrugger, G. A., 2263.
Moralee, B. E., 3313.
Morales, R. C. E., 449.
Morán, B. L., 3112.
Moran, T. J., 1757.
Moraru, E., 1541, 1542.
More, R. H., 3255.
Moreira Jacob, M., 42.
Morejohn, G. V., 307.
Morel, P., 2987.
Moreng, R. E., 2414.
Moret, R., 3179.
Moretz, W. H., 1359.
Morgan, H. R., 134, 1985.
Morgan, K. G., 980.
Morgantini, F., 630.
Morimoto, T., 1246, 2282, 2294, 2324, 3175.
Morishima, S., 793.
Moritaki, M., 793.
Morley, F. H. W., 1462.
Mornet, P., 897, 1910, 2771, 3780, 3787.
Morquer, R., 1190.
Morrill, C. C., 3551.
Morris, E. J., 1403.
Morris, E. O., 399.
Morris, J. A., 2584, 3442.
Morris, M. P., 2030.
Morris, R. G., 2048.
Morrison, G. A., 1523.
Morrison, S. M., 2626.
Morrow, J., 1760.
Morse, E. V., 759, 1169, 2221, 2807, 3398.
Mortelmans, J., 370, 713, 2179, 2224, 2225, 2849.
Morter, R. L., 759, 2807.
Mortimer, P. H., 1198.
Morton, R. K., 911, 3224.
Mosby, H. S., 2718.
Moscovici, C., 2908.
Moses, E., 2113.
Moses, H. E., 1964, 3472.
Mosier, J. E., 3700.
Mosimann, W., 595.
Mosin, V. V., 2715.
Mosinger, M., 1766.
Moskowitz, M., 3723.
Mott, J. C., 264, 2086.
Mott, L. O., 433.
Moule, G. R., 1440.
Moulton, J. E., 76, 1248, 2879, 2896, 3245, 3469.
Moultrie, F., 2063.
Mount, L. E., 265.
Moynihan, I. W., 397.
Müller, B., 170.
Müller, F. L., 2278.
Müller, H., 1067.
Müller, J., 1268, 1635.
Müller, K., 1306.
Müller, L. F., 1517, 1767, 3607.
Müller, Z., 2975.
Müller-Settele, A., 1006.
Münker, W., 2238, 3377.
Mukherjee, D. P., 3292, 3307.
Mulay, A. S., 208.
Mulcock, A. P., 2508.
Mulligan, R. M., 895.
Mulligan, W., 150, 918.
Mullins, J., 2404.
Munch-Petersen, E., 674.
Mundt, W., 772, 1181, 1563, 1899, 2546, 2822.
Munekata, K., 2300.
Munro, I. B., 2450.
Mura, D., 1866.
Muramatsu, C., 2298.
Muraschi, T., 3402.
Murnane, D., 1091.
Murnane, T. G., 1951.
Muromtsev, C. N., 2529.
Murphy, E. A., 2066.
Murray, M. D., 2923.
Muschel, L. H., 2330, 2331.
Mushett, C. W., 3593.
Musselman, M. M., 4007, page 602.
Mussill, J., 234.
Mustakallio, K. K., 2101.
Muto, T., 2331.
Mutovin, V. I., 1311, 1902.
Myers, D. K., 1411.
Myers, K., 2032, 2899.
Myers, R. M., 2106.
Mykytowycz, R., 3504.

Nachimson, H. I., 248.
Nachmausohn, D., page 658.
Nadel, E. M., 208.
Nadel, M. K., 2314, 3816.
Nagel, H. C., 2257.
Nai, D. D., 2769.
Naidu, R. K., 979.
Najjar, V. A., 1995.
Nakajima, H., 2713.
Nakajima, Y., 2379.
Nakamura, H., 2283.
Nakamura, J., 2285, 2286.
Nakamura, R., 93, 553, 824, 1959, 2379.
Nakashima, R., 2999.
Nalbandov, A. V., 304.
Nandi, S. N., 2054.
Nani, S., 1256, 1257, 1258, 1259, 1260, 2889.
Nanobashvili, V. I., 3584.
Nardelli, L., 2588.
Nash, T. A. M., 416, 3427.
Nassal, J., 705, 2171, 2482, 2484.
Nassau, E., 1120.
Natt, M. P., 2243.
Naude, C. P., 210.
Navarro, J., 1017.
De Navasquez, S., 2547.
Nazarov, G. S., 1194.
Nazarov, V. P., 2594.
Neal, A. L., 1697.
Neal, F. C., 2847.
Neal, W. M., 2663.
Neales, T. F., 2966.
Neave, F. K., 3342, 3343, 3344, 3345.
Neave, R. M. S., 3331.
Nechinennyi, D. K., 2247.
Neel, W. W., 2333.
Negretti, F., 333.
Negroni, P., 1196.
Neher, G. M., 2369, 2502.
Neimann-Sorensen, A., 3830.
Neitz, W. O., 90, 809, 2855, 2856.
Nellor, J. E., 3971.
Nelsen, O. E., 648.
Nelson, A. B., 2670.
Nelson, D. B., 1956, 3460, 3461.
Nelson, J. B., 3219.
Nelson, M. M., 1727, 2371.
Nelson, R. A., Jr., 1662.
Nelson, T. S., 3905.
Nelson, W. O., 628.
Nemeséri, L., 1685.
Nemoto, H., 1113.
Nerurkar, M. K., 3235.
Van Ness, G., 1849.
Nettleship, A., 2489.
Nettleship, M., 2489.
Neuhoff, H., 535.
Neumann, H.-J., 340, 1090, 3244, 3699.
Neumann-Kleinpaul, K., 965, 2395, 3055, page 410.
Nevenić, V., 1594.
New, W. D., 686.
Newberne, J. W., 811, 913.
Newbold, R. P., 2954.
Newbould, F. H. S., 3057.
Newing, C. R., 780, 3647.
Newlander, J. A., 523.
Newlands, M. J., 1468.
Newton, J. W., 2195.
Newton, L. G., 3003, 3194.
Newton, O. F., 1139, 2679.
Newton, O. M., 1139.
Nguyen-Ba-Luong, 3089.
Nicholes, P. S., 766.
Nichols, C. W., Jr., 524.
Nichols, R. E., 2659.
Nickalls, N. J. D., 1706.
Nicol, L., 1893.
Nicol, T., 1706.
Nieć, L., 232.
Nielsen, S. W., 562, 1747.
Nieman, R., 3125.
Niepage, H., 603.
Niesar, K.-H., 924.
Nieuwkoop, P. D., 4010.
Nigg, C., 3365.
Niggli, H. B., 216.
Nightall, E. W., 3872.
Nikiforova, N. M., 1134, 3511.
Nikolaev, V. A., 2527.
Nikolaeva, E. Y., 1889.
Nikolić, M., 3773.
Nilson, B., 2729.
Nilsson, T., 1690.
Ninomiya, M., 2349, 2350.
Nisbet, D. I., 1199.
Nishimura, Y., 2180.
Nitzschke, E., 2321.
Niven, C. F., Jr., 331.
Niven, J. S. F., 114.
Nixon, D. A., 914, 915.
Nižnánsky, F., 480, 2802, 2805, 2980.
Nobel, T. A., 1740, 3862.
Noble, K., 3365.
Nobrega, P., 822.
Nørrung, V., 1536.
Nolan, M. O., 3197.
Noller, C. H., 1733.
Noorlander, D., 1485.
Nordberg, B. K., 3443.
Nordström, G., 936.
Norman, L., 497, 1332.
Norris, L. C., 3905.
Norton, H. W., 966.
Norval, J., 647, 3115.
Notzold, R. A., 2045.
Noufflard, H., 694.
Noury, M., 2983.
Novinskaya, V. F., 2242.
Nuallain, T. O., 146.
Nunes Petisca, J. L., 65, 85, 511.
Nungester, W. J., 1187.
Nye, R. E., 3356.
Nyka, W., 2170.
Ohara, J., 2713.
Ohel, A.-L., 516, 3169.
Oberling, C., 3873.
Oberst, F. H., 594.
Obiger, G., 3061.
O'Brien, E., 2909, 3505.
Obry, J., 2709.
Ochi, Y., 3166.
O'Connor, C. T., 870.
Odendaal, W. A., 210.
O'Donnell, V. J., 631.
O'Donoghue, J. G., 2042.
Oester, Y. T., 1756.
Ofúkaný, L., 2802, 2805.
Ogata, T., 2349, 2350.
Ogita, Z., 255.
Oglesby, W. T., 434.
Ogonowski, K., 1534.
Ogura, Y., 1241, 1341.
Ohashi, M., 2298.
Ohder, H., 1969, 3682.
O'Hea, A. J., 696, 2757, page 177.
Ohkubo, Y., 429.
Ohman, A. F. S., 3333.
Ohms, J. I., 1897, 2436.
Ohshima, K., 1959.
Oka, Y., 2270.
Okaniwa, A., 2299, 2300, 2301.
Olafson, P., 3862.
Oldenburg, F., 347.
Oldfield, J. E., 564, 2961.
Olds, R. J., 1124.
Oleĭnik, N. K., 3467, 3782.
Olesiuk, O. M., 1208, 1283.
Oliva, O., 293.
Olivant, J. M., 1805.
Oliver, A. W., 2443.
Oliver, J., 3342, 3343, 3344, 3345.
de Oliveira, J. J. A., 871.
de Oliveira Dáskalos, A., 1252.
Olivo, R., 2623.
Oloufa, M. M., 2373.
Olson, B. J., 58.
Olson, C., 2786, 2787.
Olson, C., Jr., 896, 940, 3608.
Olson, L. S., 2347.
Olsson, S.-E., 2092.
Olszewski, J., 1844.
Omarov, 2801.
O'Mary, C. C., 1823, 2445, 2446.
O'Meara, D. C., 402, 1300.
O'Moore, L. B., 202, 583, 2704.
Omori, T., 1965, 1966, 2294, 2323, 2324, 3175, 3176.
Onegov, A. P., 2971.
O'Neill, E. F., 1119.
O'Neill, L., 1975.
Oochi, T., 795.
Orbell, W. G., 2613.
Orfila, J., 807.
Orlandella, V., 753, 2196, 2318, 2503, 2504, 2505.
Orlandini, C., 2481.
Orlov, E. I., 1316.
Orlov, E. S., 2797.
Orlov, P. V., 2928.
Orlova, N. N., 2594.
Orr, A. E., 2059.
Ortavant, R., 3968.
Orue, J., 3786, 3787.
Osborn, O. H., 3172.
Osborne, A. D., 3739.
Osborne, H. G., 1570.
Osebold, J. W., 3371.
Osler, A. G., 482, 483.
Osmetti, E., 358.
Osol, A., 1478, page 177.
O'Sullivan, P. J., 1303, 3194.
Ott, R. L., 136, 481, 839, 840.
Ott, W. H., 805.
Otte, H. J., 2865.
Otten, E., 760.
Otterlin, S.-E., 1205.
Ottino, J. F., 3979.
Ottosen, H. E., 1163.
Ottow, B., 3337, page 410.
Ounais, A., 1651.
Outler, J. C., 2964.
Ovejero, S., 3663.
Overbeek, G. A., 3972.
Overgoor, G. H. A., 2648.
Owen, C. R., 3182.
Owen, L. N., 597, 1407, 2699.
Oxford, A. E., 1939, 2254.
Oyaert, W., 974.
Oyrzanowska, J., 720.
Ozanian, C. H., 548.

Paál, S., 297.
Paarmann, E., 1223, 3947.
Paatsama, S., 1745.
Packham, A., 2402.
Padilla, J. M., 873.
Page, Z., 1658.
Pagnini, U., 2516.
Pagot, J., 3628.
Pakhar'kov, A. G., 3201.
Palacios García, C., 3769.
Pallaske, G., 1107, 1247, 1337, 1495, 1767, 2470, 3077, 3608, 3869, page 360.
Palmer, D. F., 1238.
Palmer, J., 2128.
Pålsson, E., 276.
Pamukcu, A. M., 217, 2639.
Panasenko, F. T., 1039.
Panciera, R., 737, 1765.
Panebianco, F., 2016, 2643, 2667.
Papadopol, M., 1516, 2296.
Papparella, V., 2317, 2516, 3493.
Paraf, A., 1543, 2513, 3716.
Parfenova, K. G., 3921.
Parfentjev, I. A., 1614.
Paris, R., 3268.
Park, S. E., page 658.
Parker, H. E., 1360.
Parker, M. V., 1508.
Parkhomenko, E. I., 3392, 3393.
Parkinson, J. E., 3568.
Parnas, J., 838, 3719, 3720, 3734.
Parnell, I. W., 1687.
Paroszkiewicz, M., 4.
Parry, H. B., 2374, 2375.
Parsons, E. H., Jr., 2394.
Partington, H., 207.
Pascual, R., 3663.
Pasteels, J., 1073.
Patchell, M. R., 3548.
Patera, E., 2782.
Paterson, A. B., 2162.
Paterson, J. S., 1147.
Patnode, R. A., 2166.
Patrick, R. S., 2076.
Patterson, A. M., 1088.
Patterson, W. C., 3772.
Pattison, I. H., 5, 6, 676, 1484, 3479.
Pauls, J., 2447.
Patyk, S., 158.
Pavuna, H., 954.
Payne, J. M., 3319.
Payne, W. J. A., 979.
Peacock, S., 2480, 2539.
Pearson, C. C., 3140.
Pearson, C. M., 2391.
Pearson, H. E., 447.
Pearson, I. G., 3156.
Pearson, J. K. L., 709, 1881.
Pecchiai, L., 2110.
Peckham, M. C., 1759.
Pedersen, P. S., 1092.
Pedini, B., 1259.
Pegreffi, G., 1101, 3396.
Pehl, K.-H., 1970, 2887.
Peisley, H. R., 3200.
Peković, B., 1594.
Pellett, P. L., 2683.
Pellissier, A., 1610.
Pelly, A. V., 2062.
Pennington, R. J., 1001.
Penny, R. H. C., 923, 2986.
Pentimalli, F., 2656.
Pepper, H., 3070.
Pepper, W. F., 1721, 2035, 2665.
Percival, R. C., 1102, 2159.
Perdue, H. S., 540, 3225.
Pereira, H. G., 2309.
Perek, M., 977.
Perera, S. J. E., 3536.
Pérez Gallardo, F., 3775.
Perini, E., 2588.
Perkins, A. G., 3162.
Perkinson, J. D., Jr., 2703.
Perlman, E., 2409.
Perman, V., 3615, 3616.
Perold, I. S., 2677.
Perry, E. J., 327.
Perry, J. S., 3028, 3029, 3642.
Perry, K. D., 2478.
Personeus, G., 2159.
Perumal Pillai, C., 166.
Pester, F. R. N., 1319.
Pesti, L., 53.
Peters, J. T., 825.
Petersen, W. E., 601.
Peterson, H. O., 3515
Petiot, M. P., 2513.
Petit, J., 3053, page 360.
Petr, G., 440, 441, 2859.
Petrak, M., 226.
Petrenko, B. G., 3921, 3922.
Petrillo, R. L., 2768, 2769.
Petrov, V. A., 2574.
Petrova, E. V., 3135.
Petrović, M., 978.
Pettenella, G., 2021.
Pettit, G. D., 3600.
Pezzoli, G., 636.
Phear, E. A., 3887.
Philip, C. B., 1291.
Philips, F. M., 873.
Phillips, D. S. M., 2740.
Phillips, P. H., 236, 1396, 2041, 3207, 3225.
Phillips, R. E., 193.
Phillipson, A. T., 2092.
Pickett, P. B., 1722.
Pierce, A. E., 861, 3518.
Pierce, H. H., Jr., 2446.
Pierce, M. H., 3518.
Piercy, P. L., 3437.
Piercy, S. E., 830, 3127.
Piergrossi, A., 3863.
Pierson, R. E., 2818.
Pieterse, P. J. S., 2361.
Pietryk, H. C., 3821.
Pigato, E., 2444, 3033.
Pigoniowa, H., 1789.
Pilcher, K. S., 3125.
Pile, C. H., 2073.
Pileggi, V. J., 206.
Pilgrim, A. F., 3886.
Pillemer, L., 1293, 1890, 3185.
Pilz, 727.
Pilz, H., 2816.
Pincus, G., 1840, 3031.
Pinguet, M., 2666.
Pinkerton, H., 465.
Pinniger, J. L., 3008.
Piomelli, S., 1650.
Pires, A., 3891.
Piringer, E., 1097.
Piringer, W., 1097.
Pirotta, F., 3095.
Pirt, S. J., 3646.
Pitt, E. A. M., 318.
Piveteau, J., 1073, 3053, page 360.
Pizzi, L., 83, 812, 3146.
Placidi, L., 468, 1498, 2303, 2312, 3164, 3481.
Planet, N., 3387.
Plastridge, W. N., 1171, 1561, 1794, 3062, 3092, 3727.
Platt, B. S., 2683.
Plescia, O. J., 862.
Plishko, N. T., 2262.
Plowright, W., 3126.
Plum, N., 1163.
Plumlee, M. P., 2369.
Plummer, P. J. G., 3541.
Pobisch, R., 1052.
Poddubski, I. V., 2487.
Podgorodetski, N. P., 3777, 3778.
Podgwaite, G. D., 1171.
Podliachouk, L., 1999, 3831.
Poelma, L. J., 433.
Pohl, G., 738.
Pokorný, V., 452.
Pokrovski, V. A., 3645.
Polge, C., 2117, 2439, 3023.
Polityńska, E., 722, 723, 724.
Pollack, A. D., 3153.
Polson, A., 1251.
Poluikovski, M. D., 1380.
Polyakov, D. K., 1317, 1318.
Polyanskaya, M. V., 1427.
Pomerat, C. M., 2885.
Pomeroy, B. S., 238, 2392, 3172, 3595, 3596.
Pomeroy, R. W., 3029.
Pomriaskinsky-Kobozieff, N., 3310.
Poncet, A., 74.
Ponseti, I. V., 3004.
Pontén, J., 3875.
Poole, J. B., 3209.
Poole, W. E., 1641.
Popa, M., 1588.
Pope, A. L., 501, 1823, 3207, 3969, 3980.
Pope, E. P., 1169.
Popluhár, L., 2935.
Popov, P. I., 2246.
Popova, Z. G., 3521.
Popovici, I., 408, 1578, 1609, 2329.
Porokhov, F. F., 2581.
Porteous, J. W., 1201.
Porter, C. C., 2245.
Porter, J. W. G., 1348, 1349.
Posokhin, E. G., 1116.
Potel, K., 442, 2883.
Potoček, M., 460.
Potter, B. J., 190.
Potter, F. E., 1027.
Potter, L. M., 2043, 2044.
Potts, R. E., 3143.
Poulsen, E., 982, 3565.
Pounden, W. D., 518, 2688, 3665, 3666.
Pouplard, L., 1308, 1330, 3199.
Powell, E., 58.
Powell, E. O., 2464.
Powers, T. E., 1173, 3114, 3721.
Powers, T. R., 1722.
Prabhu, S. S., 1028.
Pran Vohra, 526.
Prat, J., 1660, 1661.
Prawiranata, R. A. R., 1103.
Preer, J. R., Jr., 3992.
Preston, R., 2447.
Prévot, A.-R., 1895, 2215, 2819.
Price, D. A., 100.
Price, I. N. O., 3042.
Price, R. J., 3456, 3457.
Price, K. C., 1013.
Price, K. E., 433.
Price, M. A., 586.
Price, N. O., 2933.
Prier, J. E., 2894.
Priestley, F. W., 406.
Prigot, A., 776.
Primault, B., 1222.
Priouzeau, M., 1748.
Priselkova, D. O., 1519.
Pritchard, G. I., 1346.
Pritchard, W. R., 1964, 3263, 3471, 3472, 3610, 3611, 3612, 3613, 3614, 3615, 3616.
Pritulin, P. I., 2080.
Prokhorov, A. V., 2168.
Prokhorova, E., 2828.
Prokůpek, K., 364.
Prost, E., 1599.
Pruzansky, J., 489.
Puchov, V. I., 3201.
Puech, G., 2666.
Puget, E., 1190.
Pugh, P. D. S., 1786.
Pullin, J. W., 3193.
Pulsford, M. F., 332, 3503.
Puntigam, F., 445.
Purdy, M. J., 2291.
Pusat, M. M., 2475, 2586.
Pusztai, S., 11.
Putilina, V. P., 3534.
Phyl, G., 2860.

Quader, M. A., 1100.
Quadir, M. A., 22, 30, 35.
Quaglio, G., 2701.
Quander, J., 3675, 3718.
Queinnec, G., 2709.
Querner, H., 3759.
Quesada, A., 48, 1101.
Quesenberry, J. R., 2453.
Quesnel, J. J., 469.
Quevedo, J. M., Jr., 1640.
Quilliam, T. A., 3630.
Quinchon, C., 925.
Quinlan, J., 3783.
Qureshi, M. A. A., 79.

Rac, R., 1860.
Racko, H. -G., 349, 698, 2772.
Radeleff, R. D., 2632.
Radisson, J. J., 981.
Radke, M. G., 873.
Raffel, S., 1069.
Rafyi, A., 95.
Raggi, L. G., 1615, 3817.
Ragsdale, A. C., 1016.
Rahman, M. H., 35.
Raica, N., 3881.
Raitio, A., 592.
Raker, C. W., 2978.
Rako, A., 1049.
Raleigh, R. J., 2380.
Ram, T., 31, 692, 828.
Ramadan, F. M., 335.
Ramambazafy, H.-D., 469.
Ramani, K., 732.
Ramiar, H., 95.
Ramon, G., 2325, 2587.
Randall, C. C., 1622, 2280, 2601, 3468.
Randall, H. M., 697.
Randrup, A., 1604.
Rankin, J. D., 710, 711, 1861.
Ranney, A. F., 1105.
Rao, S. B. V., 1276.
Rao, S. R., 798, 799, 874.
Rapaport, E., 3286.
Rapp, F., 1663.
Rappay, D., 1129.
Rappini, F., 1712.
Rasbech, N. O., 3024.
Rasch, K., 3098.
Rasmusen, B. A., 1819.
Ratcliff, F. N., 2615.
Ratomski, A., 377.
Rauchbach, K., 3598.
Raun, E. S., 1667, 1668, 2336, 3835.
Rausch, R. L., 3165.
Rauscher, W., 3795.
Ray, H. N., 785.
Raymond, W. F., 2751.
Raynaud, A., 3032.
Raynaud, J., 3032.
Reagan, R. L., 130, 1235, 1611, 1953, 3499.
Rebell, G., 2230.
Reber, E. F., 545, 937, 1352, 2893.
Rebrov, P. I., 2527.
Recant, L., 3913, 3914.
Receveur, P., 3523.
Reculard, P., 1893.
Reddick, H. E., Jr., 2344.
Van Reen, R., 2970.
Rees, K. R., 3896.
Reeve, E. C. R., 1687.
Reeves, W. C., 3780.
Rehfeld, C. E., 3610, 3611, 3616.
Reich, C. V., 2221, 3475.
Reichel, K., 1767, 3607.
Reid, C. H., 2205.
Reid, D., 3473.
Reid, E. T. M., 1310.
Reid, J., 1428.
Reid, J. T., 901.
Reid, M. E., 3573.
Reid, W. M., 2064.
Reineke, E. P., 1790.
Reinhard, K. R., 3165.
Reinius, L. R., 2722.
Reiss, F., 60.
Reith, J. W. S., 1719.
Reitman, M., 3735.
Renk, W., 1383.
Renner, G., 520.
Renoux, G., 43, 44, 751, 2535, 2536, 3113, 3395.
Renwick, C. C., 2248.
Ressang, A., 2353.
Rettenmaier, L., 787.
Reuss, U., 12, 344, 1501, 3072.
Reusse, U., 2248, 3756.
Reyniers, J. A., 2363.
Reynolds, B. A., 391.
Rheins, M., 2777, 2778.
Rheins, M. S., 707.
Rhoad, A. C., 2765, page 177.
Ribeiro, J. M., 3742.
Ribeiro Baptista, A. I., 2295.
Ribelin, W. E., 2857.
Rice, C. E., 137, 194, 1865, 1998.
Richard, C. G., 1286.
Richards, R., 1666.
Richards, S. H., 555, 3790.
Richardson, L. R., 2372.
Richardson, N., 2191.

Riches, J. H., 1303.
Richey, D. J., 2631.
Richou, R., 673.
Richou, R. (Mme.), 673.
Richter, J., 3098.
Richter, J. H. M., 1983.
Richter, K., 515.
Rickard, C. G., 2610.
Riddell, W. H., 1346.
Riddihough, M., 3093.
Rieck, G. W., 1920.
Riedel, B. B., 3860.
Riedesel, M. L., 2719.
van Riel, J., 755.
van Riel, M., 755.
Rigdon, R. H., 930, 3543.
Riggin, G. T., Jr., 2931.
Righetti, A. T., 548.
Riis, P., 2458.
Rimington, C., 1078.
Ringer, R. K., 3597.
Riser, W. H., 171, 2609.
Riss, W., 1054.
Ristic, M., 61, 3418, 3929.
Rittenberg, S. C., 415.
Ritter, H. W., 3679.
Ritts, R. E., Jr., 1503.
Rižnar, S., 2435.
Rizzo, H. R., 1640.
Robblee, A. R., 2133.
Roberts, D. C., 2277.
Roberts, F. H. S., 168, 500.
Roberts, G. B. S., 2779.
Roberts, G. F., 3512.
Roberts, K. B., 487.
Roberts, R. B., 2756, page 360.
Roberts, R. H., 2861.
Roberts, S. J., 1367, 2840.
Roberts, S. R., 3599.
Robertson, A., 544, 560, 3986.
Robertson, A. G., 872.
Robertson, M., 3755.
Robertstad, G. W., 2127, 3545.
Robinson, K. W., 1050.
Robinson, M. C., 660, 2754.
Robinson, T. J., 1815, 3308.
Roby, T. O., 3435.
Rochon-Duvigneaud, A., 1073,
Rockhold, W. T., 3636.
Rodabaugh, D. E., 1255.
Rodman, M., 3668.
Rodríguez Loustau, J. A., 764, 1040.
Rodwell, A. W., 2834.
Roe, C. K., 1747.
Roe, J. E. R., 665, 2148.
Rödel, L., 286, 626.
Röhrer, H., 1631, 1970, 3800.
Van Roekel, H., 1148, 1208, 3379, 3497.
Roemmele, O., 3378.
Roessler, W. G., 3086.
Roger, A., 2585, 3820.
Roger, F., 132, 1290, 1986, 2585, 3820.
Rogers, D. E., 3059.
Rogers, J. A., 1736, 2690, 2978.
Rohde, R., 2733.
Roine, P., 592.
Roldán, R. R., 2743.
Rolle, M., 772, 983, 1563, 1777, 2552.
Rollinson, D. H. L., 1031, 1465.
Romagnoli, A., 3649.
Romanelli, V., 1601.
Romanowska, M., 1402.
Romijn, C., 1058, 3566.
Romiti, R., 295.
Romváry, J., 743, 744, 758.
Roncalli, R., 1601.
Rook, A., 3099.
Rook, J. A. F., 199, 581.
van Roon, T., 2984.
Rooney, J. R., Jr., 3789.
Roots, E., 1165.
Rosati, P., 266.
Rosati, T., 703, 2781.
Rosdail, J. R., 1459.
Rose, H. W., 231.
Rose, I., 3842.
Rose, J. H., 505, 3527.
Rosenau, W., 986.
Rosenberg, M. M., 3884.
Rosenberger, G., 204, 708, 1047, 1336, 2654, 2880, 3220, 3221, 3242.
Rosendal, K., 3669.
Rosenthal, M. W., 3602.
Rosický, B., 2927.
Roško, L., 2800.
Ross, J. M., 686.
Ross, M. A., 2668, 2702.
Ross, O. B., 2670.
Ross, R. T., 2192, 3380.
Ross, W. G., 1957.
Rossi, C., 2820.
Rossi, P., 378, 754, 2582, 2806, 3139.
Rossiter, R. C., 184.
Rosted, A. F., 2341.
Rostovtseva, I. A., 1128.
Roth, A. R., 866, 2001.
Roth, F. B., 1890.
Roth, P. C. J., 2124.
Rottensten, K., 1452.
Rougier, G., 2096.
Roulston, W. J., 1314.
Rountree, J. L., 402.
Rousseau, M. M., 3623.
Rowe, M., 2734.
Rowe, W. P., 3491.
Rowley, D., 3822.
Rowley, D. A., 58.
Rowsell, H. C., 3366.
Rowson, L. E., 1029, 2118.
Rowson, L. E. A., 296, 1437, 2117, 3964.
Roy, A., 278, 296.
Roy, J. H. B., 2128.
Rubenkov, A. A., 934.
Rubin, R., 504, 2014, 2640, 3211.
Ruch, J., 3365.
Ruebner, B., 3887.
Rushchits, A. S., 2858.
Rushworth, W. E., 3600.
Russell, P. S., 2728.
Russell, R. R., 398.
Russell, S., 1828.
Russell, W. O., 2649.
Rust, J. H., 230, 569, 775, 963, 2068.
Ruthe, E., 3097.
Ryabova, G. S., 1193, 1195, 3347.
Rydell, R. O., 909.
Ryder, M. L., 2748.
Ryff, J. F., 3413.
Ryley, J. W., 1883, 3321.
Ryu, E., 2785.

Sabban, M. S., 2562.
Sabjan, I., 1012.
Sacchi, E. M., 2602.
Sacher, G. A., 2995.
Sackmann, W., 106, 3110.
Sadek, S. E., 1779.
Sadovskaya, L. I., 3777, 3778.
Sadun, E. H., 497.
Saenz, A., Jr., 15.
Safarov, K. M., 2204.
Safford, J. W., 2370, 3903.
Sagner, G., 1744.
Sahasrabudhe, M. B., 3235.
Sainsbury, D. W. B., 2129, 3089.
Sainsbury, R. W., 2438.
St. Garay, A., 3618.
Saint-Paul, M., 3820.
Saison, R., 2919.
Saito, J., 2603, 3469.
Saito, J. K., 98.
Sakai, T., 93.
Sakamoto, T., 1959.
Saladino, E., 1522.
Salamon, I. I., 3314.
Salánki, J., 1206, 1207.
Salerno, G., 3294.
Salisbury, G. W., 619, 621, 3967.
Salles Gomes, C. E., 1906.
Salmon Legagneur, E., 3231.
Salsbury, R. L., 3895.
Salt, F. J., 892.
Salvi, A., 3116.
Salvin, S. B., 59, 139.
Salvioli, G., 3349.
Salvioli, G. P., 3349.
Samberg, Y., 1869.
Sampson, J., 545.
Samuel, J. McA., 89.
Sandbu, H., 3696.
Sander, W., 1742.
Sanders, D. A., 61, 3418, 3929.
Sanders, M., 91, 1617.
Sandersleben, J. 2022, 2354.
Sanderson, M., 3253.
Săndulescu, S., 1504, 1505.
Sanger, V. L., 810, 3803.
Sano, M., 1321.
Sansoè, D., 678.
Del Santo, F., 1712.
Santucci, J., 1498.
Sarkisov, A. K., 2758, 3938, 3939.
Sarles, W. B., 3094.
Sarwar, M. M., 151, 163.
Sasahara, J., 2299, 2300, 2301, 2302.
Saslaw, L. D., 208.
Sather, G. E., 3780.
Sato, A., 3166.
Sato, G., 824, 1961.
Sato, U., 2180, 2886, 3476.
Satoh, H., 553, 2379.
Sauer, F., 3616.
Sauerwein, H., 3277.
Saunders, L. Z., 2394, 3908.
Sautter, J. H., 3610, 3611, 3612, 3613, 3614, 3615, 3616.
Savel'volf, G. B., 683.
Savinskaya, N. V., 1801.
Sawa, I., 2292.
Sawada, T., 1321.
Sawyer, M. T., 3371.
Saxe, L. H., 2841.
Sazhin, S. G., 2197.
Scaife, J. F., 1424.
Scarisbrick, R., 1786.
Scatozza, F., 104, 1256, 1258, 1260.
Scatterday, J. E., 88.
van der Schaaf, A., 1122.
Schaaf, J., 1109, 1110, 1378, 3249, 3686.
Schaaf, K., 1616.
Schaal, E., 3105.
Schaedler, R. W., 1186.
Schäfer, W., 117, 1272.
Schaeffer, M., 3775, 3819.
Schaetz, F., 2119, 2123, 2773.
Schaffner, B., pages 177 and 658.
Schaible, P. J., 188.
Schalm, O. W., 1485.
Schambye, P., 1797, 2090.
Scharpenseel, H. W., 1351.
Schebitz, H., 390.
Scheel, E. H., 2289.
van der Scheer, A. F., 3715.
Scheff, G. J., 2839.
Scheff, I. M., 2839.
Scheibner, G., 765, 768.
Scheidy, S. F., 249, 392.
Schellner, H., 613, 1117, 3677, 3795.
Scherago, M., 2867.
Scherer, R. K., 3666.
Scherr, G. H., 404.
Schettini, F., 1650.
Schiebner, G., 388.
Schieler, W., 985.
Schierholz, H., 1096.
Schiff, W., 1497.
Schildmeyer, 1527.
Schiller, H.-J., 2462.
Schimpl, M., 3082.
Schinckel, P. G., 1056, 1408.
Schindler, H., 2113.
Schindler, R., 726, 1974, 2200, 3484.
Schipper, I. A., 555, 1377, 3790, 3879.
Schjerning-Thiesen, K., 3443.
Schliesser, T., 706, 2163.
Schlossberger, H., 394.
Schlotthauer, C. F., 3638.
Schlütter, H., 3759.
Schmahlstieg, R., 2455.
Schmid, G., 690, 1264.
Schmidt, D., 1242, 2884, 2906, 3465.
Schmidt, D. A., 1728, 1729.
Schmidt, H. W., 3936.
Schmidt, S., 1603.
Schmidt, U., 2906, 3178.
Schmidt-Nielsen, B., 253, 2431, 3012.
Schmidt-Nielsen, K., 253, 2431, 3012.
Schmitthenner, W., 1854.
Schnauder, G., 369.
Schneider, B., 1226, 1227.
Schneider, B. H., 1130.
Schneider, P. A., 3708.
Schneierson, S. S., 2409.
Schoenaers, F., 1161, 1862.
Schönberg, F., 29, 1084.
Schoenberg, M. D., 1293.
Schönherr, J., 629, 1587.
Schoenherr, K.-E., 2845.
Schoening, H. W., 124.
Schoettle, C. E., 545, 937.
Schofield, F. W., 560, 561, 562, 951, 3480.
Scholtyseck, E., 2576, 2851.
Scholz, H.-D., 3695, 3717.
Schoof, H. F., 2335.
Schooley, M. A., 2365.
Schoop, G., 474, 520, 931, 1449, 1644, 3174, 3710.
Schopen, H., 975.
Schreiber J., 988, 3626.
Schreier, K., 3097.
Schroeder, C. R., 3807.
Schrödl, M., 1138.
Schubert, J., 3602.
Schubert, J. H., 3401.
Schuckmann, B., 1213.
Schürmann, E., 740.
Schulte, F., 675, 975, 3695.
Schultze, M. O., 3610, 3611, 3612, 3613, 3614, 3615, 3616.
Schulz, F., 3075.
Schulz, K. C. A., 1009.
Schulz, L.-C., 2388.
Schulze, W., 1041, 1867, 1977, 3257, 3952.
Schumann, H., 2456, 2459.
Schuster, E. H. J., 3993.
Schwarte, L. H., 2605.
Schwarz, J., 2228, 3415.
Schwetz, J., 2009.
Schwichtenberg, N., 3101.
Sciple, G. W., 1177.
Sciutteri, G., 2016.
Scorgie, N. J., 2129, 3989.
Scott, E., 3365.
Scott, F. S., 3305.
Scott, G. R., 96, 3473.
Scott, K. W., 3648.
Scott, M. L., 3905.
Scott, T. H., 3325.
Scrimshaw, N. S., 2052, 3374.
Seadale, E. H., 2313.
Sears, J. E., 3993.
Šebetić, Č., 1243, 2877.
Second, L., 1185.
Sedlemeier, H., 3767.
Seeger, K. C., 3456, 3457.
Seele, 1565.
Seele, W., 368.
Seelemann, M., 349, 698, 2772, 3061, 3714.
Seekles, L., 2672.
Seelig, G., 3699.
Seeliger, H., 28, 2467.
Seeliger, H. P. R., 3118.
Segal, M. S., 1394.
Segre, D., 896, 2786, 2787.
Seibert, F. B., 1510.
Seibold, H. R., 437, 913, 2055, 2184.
Seidel, G., 1804.
Seiersen, C. A., 2985.
Seifert, L., 1307.
Seiffert, G., 1646.
Seiler, H. E., 3115.
Self, H. L., 1342.
Self, H. R. M., 1886.
Selinanov, A. V., 773.
Sell, J., 170.
Sella, A., 2021.
Sellers, A. F., 260, 2093, 3617.
Sellers, K. C., 741, 1439.
Sellers, R. F., 1605.
Selye, H., 1374, 3899.
Semenov, P. V., 1930.
Semmel, M., 47.
Sen, H. G., 785.
Seneca, H., 2412.
Seneviratne, R. D., 878, 2635
Senze, A., 3132.

Serain, C., 2088.
Serbănescu, C., 1629, 2381.
Serdyuk, S. I., 3393.
Sergent, E., 74, 670.
Sergent, G., 3142.
Sérié, C., 444.
Seronde, J., Jr., 352, 3909, 3910.
Serra, A., 2868, 2873.
Serra, P., 678.
Sessi, P., 365, 381.
Setchell, B. P., 932, 933, 1732, 2976, 3580.
Seto, K., 2689.
Shafei, M. M., 2098.
Shah, M. K., 3320.
Shah, S. U., 36.
Shain, D. A., 1612.
Shalash, M. R., 1535, 2105.
Shamir, D. H., 873.
Shankar, K., 1560.
Shanks, P. L., 1263, 3940.
Shanmugam, S., 827.
Sharma, G. L., 1916.
Sharma, R. M., 692, 828.
Sharma, U. D., 1028.
Sharman, G. A. M., 2973, 3554.
Sharp, D. G., 176, 1281.
Shat'ko, P. D., 2216.
Shaw, I. G., 1432
Shaw, J. C., 546, 547, 548.
Shawver, C. B., 3226.
Shchepilov, N. S., 1112, 3357.
Shear, C. L., 778.
Shear, H. H., 446.
Sheard, P., 247.
Shechmeister, I. L., 2497.
Shen, R. M., 2594.
Shepard, H. H., 3049.
Sheriff, R. B., 3732.
Sherlock, S., 571.
Sherry, S., 1753.
Shewan, J. M., 2732.
Shibata, D., 1241, 1339, 2301.
Shibata, R., 553.
Shibata, S., 2490.
Shibata, T., 2874.
Shiga, K., 2996.
Shillam, K. W. G., 2128.
Shimizu, K., 824, 1114.
Shimizu, T., 2276.
Shipkowitz, N. L., 2564.
Shishkina, E. Y., 701.
Shmulevich, A. I., 1595, 1932.
Shoho, C., 3535.
Shone, D. K., 1217.
Shope, R. E., 1262.
Short, B. F., 3550.
Shou, Shen Young, 3799.
Shrigley, E. W., 513.
Shtern, E. A., 683.
Shults, R. S., 3537, 3538.
Shultz, G., 451, 2837, 3159.
Shulyumova, E. S., 2589.
Shuman, R. D., 1382, 2385.
Shumard, R. F., 501, 555, 2017, 3207, 3790.
Shupe, J. LeG., 2380, 2575.
Sibalić, S., 1594.
Siddiqui, A. H., 1761.
Siddle, P. J., 3424.
Sidlofsky, S., 2963.
Sidorov, P. A., 2362.
Sieburth, J. McN., 2392, 3595, 3596.
Siegert, R., 1644.
Siegmann, O., 121, 1274, 2854.
Sieriro, F., 2194.
Siekmann, F. W., 1735.
Sigel, M. M., 3819.
Sigurdsson, B., 2496.
Sikes, D., 2502.
Sikes, R. K., 3460.
Silk, J. A., 3120.
Sillioc, R., 1895, 2819.
De Silva, P. L. G., 620.
Da Silva Leitão, J. L., 420.
Silverman, P. H., 2010, 2011.
Simek, A., 2169.
Simesen, B., 593.
Simesen, M., 982.
Simon, J., 2227.
Simonnet, H., 178.
Simons, C. S., 230.
Simonsen, L., 467, 2901.
Simonsen, M., 140, 3823.
Sims, F. H., 1344.
Šimůnek, J., 1327.
Sinclair, K. B., 1627.
Sing Chen Chang, 1611.
Singh, G. B., 1326.
Singh, M. M., 679, 715, 1871.
Singh, S., 2229.
Singleton, W. B., 1973.
Singsen, E. P., 2043, 2044, 3572, 3906.
Sinha, P. K., 3846.
Sinha, S. K., 118.
Sinkovics, J., 1990.
Sinks, J., 1054.
Sinnecker, H., 2637.
Siñov, A. V., 4004.
Sîrbu, P., 1585.
Sîrbu, Z., 2381.
Sizer, I. W., 2036.
Sjollema, B., 922.
Siolte, J. P., 108.
Skaller, F., 3301.
Skjerven, O., 1184, 2739.
Škoda, R., 2904.
Skude, I. M., 982.
Skulski, G., 797.
Slanina, L., 835, 2935, 3018.
Slater, E. C., 3904.
Slapak, L., 3931.
Slavin, D., 806.
Slen, S. B., 2747.
Slinger, S. J., 1721, 2035, 2665.
Sloan, J. E. N., 156, 879.
Small, N., 3750.
Smart, W. W. G., Jr., 1451.
de Smet, R. M., 432.
Smith, A. H., 2421, 2422.
Smith, A. M., 901.
Smith, C. E. G., 86.
Smith, C. H., 3704.
Smith, C. K., 3895.
Smith, C. L., 1666.
Smith, D. F. G., 3271.
Smith, D. G., 3153.
Smith, D. J., 142.
Smith, D. J. W., 1886.
Smith, D. W., 697, 1857.
Smith, E. W., 3544.
Smith, F. E., 254.
Smith, H., 336, 684, 685, 3063, 3674.
Smith, H. A., 229.
Smith, H. R., 3803.
Smith, H. Williams, 359, 372, 2506, 2788, 3382.
Smith, I. M., 632, 676, 1484.
Smith, I. W., 2509.
Smith, J. C., 3551.
Smith, J. M., 1186.
Smith, J. MacLean, 1847.
Smith, J. R., 1013.
Smith, J. W., 2619.
Smith, K. L., 3749.
Smith, K. M., 323, 1288.
Smith, L. D., 3409.
Smith, M. R., 3670, 3671.
Smith, O. H., 2211.
Smith, R. N., 2726.
Smith, R. T., 1294, 1295, 3672.
Smith, S. E., 1716.
Smith, W. E., 3356.
Smither, A. M., 3381.
Smyth, J. D., 3198.
Smythe, R. H., 2763, page 410.
Snell, K. C., 2065, 3591.
Snijders, A. S., 1911.
Snoeyenbos, G. H., 1285.
Snow, G. A., 2277, 3462.
Snowball, G. J., 3190.
Snyman, H. W., 210.
Snyman, P. S., 2160.
Sobey, W. R., 2308, 2618, 3184.
Sobiech, T., 3074.
Sobinevschi, V., 1585.
Sobolev, A. A., 1555.
Soehring, K., 596.
Sørensen, P. H., 3911, 3912.
Sohier, R., 3179.
Sojka, W. J., 3381.
Sokolov, N. I., 2572.
Soliman, K. N., 1333.
Solnitzky, A., 1629.
Solomkin, P. S., 1950, 3448.
De Somer, P., 591.
Sommer, A. F., 1398.
Sommers, S. C., 226.
Somova, A. G., 682.
Sonder, J. K., 2343.
Sonea, S., 1482.
Songer, J. R., 3466.
Sonoda, M., 93, 553, 824, 1950.
Soret, M. G., 91, 1617.
Sorkin, E., 1851, 1852.
Sotiriu, E., 2296.
Soulsby, E. J. L., 877.
Southgate, B. A., 3963.
Souza, R., 989.
Spaïs, A. G., 3890.
Spalatin, J., 1254.
Sparks, L. L., 986.
Spear, M. L., 2079.
Spears, H. N., 1492.
Speck, J., 1115.
Speer, V. C., 1710.
Speicher, J. A., 547.
Spencer, G. R., 20, 1130.
Sperling, F. G., 413, 1283.
Sperry, O. E., 1769.
Spielman, A. A., 1795.
Spiler, E., 40.
Spindler, L. A., 3515.
Spisni, D., 903, 904, 905, 1369.
Splitter, E. J., 1220, 1978, 3436.
Spörri, H., 262.
Sprehn, C., 588, 882, 2932.
Sprengers, R., 3199.
Sprent, J. F. A., 887, 3214.
v. Sprockhoff, H., 884.
Spruth, H. C., 539, 540.
Spryszak, A., 3781.
Spuhler, V., 2263.
Squibb, R. L., 2052, 3374.
Squire, F. A., 1415, 2240.
Srivastava, H. D., 3846.
Stableforth, A. W., 614, 1878.
Stahl, H., 1022.
Stahl, W., 182.
Stamatin, N., 1494, 2187.
Stamm, D. D., 1956, 2592, 3460, 3461, 3819.
Standen, O. D., 1677.
Stanier, R. Y., 1069.
Stanton, H. T., Jr., 477.
Staples, E. L. J., 577, 579, 3601.
Starosel'ski, L. S., 1455.
Staśkiewicz, G., 1402.
Staub, A.-M., 7.
Stavraky, G. W., 587.
Stearner, S. P., 3253.
Stebbins, M. R., 3807.
Steck, W., 2279.
Stědra, H., 2169.
Steele, J. H., 1118.
Steenbock, H., 206, 268.
Stefanova, E. P., 2383, 2531.
Stefański, W., 1683, 2941.
Steffan, H., 1868.
Steffee, C. H., 2065, 3591.
Stegenga, T., 1045.
Stein, C. D., 1849, 1960, 3466.
Steinegger, P., 2684.
Steinert, C., 693.
Steinert, M., 3753.
Stenberg, H., 729.
Stenderup, A., 1904, 2551.
Stéphan, F., 1073.
Stephan, J., 2486.
Stępkowski, S., 2544.
Sterne, M., 1892.
Stévenin, G., 1245, 1624.
Stevens, A. J., 3854.
Stevens, C. E., 3617.
Stevenson, G. S., page 177.
Stevenson, J. W., 2385.
Steward, J. S., 1334.
Stewart, C. J., 3354.
Stewart, D. F., 2013.
Stewart, J., 533, 1719, 1720.
Stewart, R. E., 3272.
Stewart, S. E., 3815.
Steyn, D. G., 210, 211.
Stilinović, Z., 3868.
Stinebring, W., 1283.
Stoeber, M., 3309.
Stoenescu, V., 1504, 1505.
Stoenner, H. G., 3399.
Stoerk, H. C., 2999.
Stohlman, F., Jr., 2597.
Stoker, M. G. P., 858, 859, 1656, 1658.
Stoll, L., 396.
Stoll, R., 1817, 1818.
Stol'nikov, V. I., 1875.
Stone, J. L., 1188.
Stone, S. H., 3410.
Stone, W. M., 891.
Stoner, H. B., 3258.
Story, C. D., 2447.
Stothers, S. C., 1728.
Stovell, P. L., 397.
Stowe, C. M., 580.
Strande, A., 226.
Strassmann, R., 25.
Strauch, D., 384, 536, 1165, 3377.
Strukova, G. N., 1316.
Strumza, M. V., 2097.
Stryszak, A., 717, 720.
Stuart, E. E., 3162, 3920.
Stuart, R. D., 3117.
Stuart-Harris, C. H., 1994.
Stubbe, A. E., 1458.
Stünzi, H., 510.
Stunkard, H. W., 3840.
Stuoebel, C. F., 3936.
Sturkie, P. D., 3597.
Stubbotin, V. M., 1143.
Sugawa, Y., 1339, 1341.
Sugimura, K., 2299, 2886, 3476.
Sulitzeanu, D., 1878.
Sullivan, R., 2127.
Sulzbacher, F., 3118.
Summers, P. W., 1187.
Summerskill, W. H. J., 572.
Sumner, F., 3818.
Sundberg, O. T., 3169.
Sunde, M. L., 3557.
Sunkel, W., 210, 211.
Supperer, R., 2020.
Surján, M., 3725.
Sutherland, A. K., 422.
Sutherland, T. M., 1001.
Sutton, R. M., 2556.
Suvorov, K. R., 2714.
Suzuki, S., 2596.
Suzuki, Y., 1182, 1183, 2219.
Svanberg, O., 173, 1693.
Svec, H. J., 710.
Svec, R., 508.
Svehag, S.-E., 3340.
Svenneby, G., 3556.
Svetličić, B., 2930.
Swain, R. H. A., 473, 2201.
Swan, J. F. C., 3998.
Swann, H. C., 2514.
Swanson, L. E., 891.
Swanson, M. H., 2706.
Swanton, M. C., 306.
Sweney, H. C., 2953.
Swenson, M. J., 2977, 3877.
Swingle, K. F., 200, 2370, 3569, 3903.
Swisher, S. N., 310.
Switzer, W. P., 2234.
Swope, R. E., 3788.
Sykes, A. H., 3643.
Sykes, J. A., 3386.
Sykes, J. F., 640.
Sylstra, A. W., 3498.
Symons, L. E. A., 67.
Sysoev, A. S., 1937.
Szabó, G., 1826.
Szabó, I., 1557, 1751, 1913, 2920.
Szabó, S., 3408.
Szabó Szücs, J., 1496, 2491.
Szabuniewicz, M., 1590.
Szafir, J. J., 248.
Szaflarski, J., 455, 1919.
Szakmáry, G., 125.
Szczudłowska, M., 258.
Szczygielska, J., 838.
Széky, A., 757, 2921.
Szeness, L., 1550.
Szent-Iványi, M., 814.
Szent-Iványi, T., 1557, 2921, 3408.
Szilágyi, T., 1298.
Szilárd, J., 998.
Szöllösy, E., 1608, 1946, 1949.
Szumowski, P., 2441, 3309.
Szynkiewicz, Z., 718, 2783.

Taga, L., 2206.
Taga, M., 408, 1578, 1607, 1609, 2187.
Tajima, Y., 2155, 2490.
Takács, L., 814.
Takahashi, I., 1339.
Takamiya, T., 553.
Takanami, H., 1241.
Takanami, M., 2874, 2996.
Takasugi, T., 2174.
Takátsy, G., 1825.
Takematsu, M., 1246, 2282.
Taketa, F., 3225.
Takizawa, T., 3166.
Talanti, S., 1745.
Taliaferro, W. H., 3508.
Talmage, D. W., 3508.
Talmage, R. V., 248.
Talsma, D., 2413.
Tamalet, J., 1546.
Tammemagi, L., 610, 611, 3205.
Tanabe, K., 793.
Tanaka, K., 2996.
Tanaka, T., 2155.
Taneja, G. C., 339, 1409, 2416.
Tanner, J. M., 1469.
Tarazona Villas, J. M., 2015.
Tarczyński, S., 876, 2641.
Tardieux, P., 2215.
Tarlatzis, C., 410, 817.
Tarnóczy, T., 998.
Taroverdov, L. N., 1145.
Tarshis, M. S., 1508.
Tasaka, T., 375.
Taveira, M., 235.
Tayler, J. C., 2751.
Taylor, A., 1021.
Taylor, C. B., 1009.
Taylor, D. B., 1964.
Taylor, D. E. B., 3472.
Taylor, J., 2515.
Taylor, J. H., 185, 186, 456, 1706.
Taylor, J. I., 1465, 1835.
Taylor, J. R. E., 1126.
Taylor, L. W., 1615.
Taylor, R. M., 3267.
Taylor, S., 3565.
Taylor, W. H., 2375.
Teague, H. S., 1343.
Teige, J., 1814, 2120.
Teklińska, M., 472, 1277, 2310.
Telling, R. C., 3414.
Temperton, H., 180.
Tempest, D. W., 3674.
Tepper, I., 883.
Terent'ev, F. A., 2383, 2531.
Terhaar, C. J., 2945.
Terpstra, J. I., 2545.
Terrill, S. W., 2045.
Terry, R. A., 908.
Terskikh, V. I., 1888.
Terzin, A. L., 3400.
Tesar, W., 1648.
Teuber, H. L., page 246.
Teunissen, G. H. B., 2684, 3639.
Tevosov, A. M., 2531.
Thal, A., 1, 1093.
Thal, E., 1529.
Tharp, V. L., 1918.
Theve, N. O., 3943.
Thibault, C., 3968.
Thibault, P., 1185.
Thiel, W., 699.
Thieme, E., 1386, 3250.
Thienpont, D., 1210, 2644, 2647.
Thiéry, G., 1910, 2593, 3784, 3785, 3787.
Thiéry, J.-P., 1942.
ten Thije, J. H., 2353.
Thimann, K. V., 1840.
Thomas, A. J., 1399.
Thomas, J.-A., 1944.
Thomas, L., 1294, 1295, 3672.
Thomas, R. J., 3854.
Thomas, W. E., 1696.
Thompson, C. H., Jr., 124, 1980.
Thompson, H. V., 843.
Thompson, J. H., Jr., 1320.
Thompson, S. Y., 926.
Thompson, W. R., 3325, 3878.
Thomsen, A., 1544, 3111, 3711.
Thomson, A. P. D., 606.
Thomson, W., 3990.
Thorbeck, G., 1703, 1704.
Thorbecke, G. I., 2915.
Thordal-Christensen, A., 566, 1268, 2390, 3167.
Thorne, J., 1922, 2575.
Thorne, J. L., 1918.
Thornberry, H., 1564.
Thornton, J. L., 1089, 1665.
Thorp, F., Jr., 2040, 3369, 3894.
Thorp, J. M., 3120.
Thorshaug, K., 2841.
Thorson, R. E., 2937, 2938.
Thrasher, D. M., 2369.
Threlkeld, W. L., 2933.
Thurston, J. R., 707, 2777, 2778.
Tickner, C., 702.
Tidbury, G. E., 319.
Tiecco, G., 102, 103, 1256, 1257, 1258, 1260.
Tierkel, E., 3150.
Tigano, F., 865.
Tigaud, J., 3179.
Tiggelman-van Krugten, V. A. H., 87.
Tilga, V. V., 1381.
Tillman, H., page 658.
Tillmann, H., 625.
Timm, W., 2638.
Timmons, H. F., 2230.
Tini, R., 703.
Titus, H. W., 2410.
Tobias, C. A., 1066, 4009, page 508.
Tobiska, J. W., 3262.
Todd, A. C., 3849.
Du Toit, R., 1991, 2005, 2024, 2925.
Tokin, I., 1594.
Tokuda, G., 3176.
Tolbert, B. M., 1413.
Tolle, A., 2426, 2427.
Tolstyak, I. E., 3367, 3368.
Tomáš, J., 2800.
Tomlin, D. H., 529.
Tomlin, S. C., 551, 552.
Tomlinson, A. R., 3299, 3300.
Tompkins, V., 3402.
Too, K., 93, 553, 1959.
Toop, C., 3071.
Topham, J., 3503.
Topolnik, E., 2570, 2875, 2877.
Torlone, V., 2621.
Torre, E. J., 1640.
Torrie, J. H., 2436.
Toshach, S. E., 750.
Toucas, L., 925, 3812.
La Touche, C. J., 62, 1197.
Tourtellotte, M., 3423.
Tourtellotte, M. E., 1171.
Toygarli, S. A., 3217.
Tozzini, F., 1580.
Trace, J. C., 3270.
Traub, E., 2866.
Traum, J., 443, 1632.
Trautwein, K., 705, 3678.
Travassos Santos Dias, J. A., 417.
Trawinski, A., 3852.
Treffers, H. P., 2330.
Tresselt, H. B., 1488, 1489.
Trevan, D., 3315.
Tribe, D. E., 3232.
Trilenko, P. A., 1896, 2523.
Trimberger, G. W., 292.
Triozon, F., 378, 3139.
Trofimov, I. T., 3134.
Troitski, I. A., 1673.
Tromba, F. G., 1953.
Tronin, A. A., 2528.
Tropa, E., 84, 85.
Trowbridge, R. F., 3620.
Trum, B. F., 230, 568, 569, 775, 963, 2068, 3007, 3265, 3296.
Truscoe, R., 3279.
Truszczyński, M., 1630, 1750.
Tsitsin, N. V., 1672.
Tsomaya, I. V., 3434.
Tsuchiya, Y., 375, 2490.
Tsuda, T., 2689.
Tsuji, S., 695.
Tsunekane, T., 793.
Tsunoda, K., 429.
Tuchmann-Duplessis, H., 1032.
Tucker, J. F., 2131.
Tucker, J. O., 2127, 3545.
Tuckerman, E. D., 9.
Tudor, D. C., 448.
Tuffery, A. A., 3590.
Tullis, J. L., 570.
Tully, R. I. J., 1089.
Tunkl, B., 2774.
Tupitsuin, I. G., 2833.
Turevich, S. T., 2594.
Turk, R. D., 586, 2944.
Turman, E. J., 2956.
Turner, A. W., 68, 2960, 3627, 3740.
Turner, C. W., 212, 1446, 1822, 2731, 3314.
Turner, D. S., 2945.
Turner, G. C., 863.
Turner, H. N., 1824.
Turner, J. H., 881.
Turner, N., page 177.
Turner, R. B., 248.
Turton, E., 1824.
Turudić, V., 943.
Tutt, J. B., 944, 1898.
Tutushin, M. I., 3448.
Tuzova, P. V., 1160.
Tvorić, S., 1243, 2817.
Twiehaus, M. J., 1220, 3436, 3700.
Twigg, G. D., 247.
Twohy, D. W., 3210.
Tyler, C., 1713.
Tyler, W. J., 287.
Tymniak, M., 3073.
Tyndale-Biscoe, C. H., 2072.
Tyrrell, D., 3144.
Tyrell, D. A. J., 135.
Tyulpanova, A. F., 1880.

Ubatuba, F., 2418.
Überreiter, O., 2024.
Ueno, H., 2350.
Ueno, T., 1321.
Ugo, S., 1038.
Ugorski, L., 650.
Uhlenhuth, P., 1587.
Ulberg, L. C., 294.
Ulbrich, F., 3038.
Ullberg, S., 1404.
Ulner, W., 3977, 3978.
Ulrey, D. E., 2045, 3901.
Van Ulsen, F. W., 1189.
Umezu, M., 2689.
Underbjerg, G. K. L., 2977, 3877.
Underdahl, N. R., 837, 1971.
Underwood, E. J., page 508.
Underwood, J. R., 2026.
Underwood, P. C., 403, 3417.
Uppal, D. R., 3100.
Urban, W. D., 1000.
Urbaschek, B., 2426, 2427.
Uriel, J., 3327.
Urquhart, G. M., 150, 1324, 2346, 3845, 3866.
Ursíny, 2891.
Utsi, M. N. P., 145.

Vaccaro, A., 3693.
Vachel, J. P., 3228, 3229, 3230.
Valadao, F. G., 2620.
Valdina, G., 2723.
Valenstein, E. S., 1054.
Vallée, A., 118, 464, 1639, 1642, 1643, 1968, 2199, 2307, 2512, 3729.
Vallenas, P. G. A., [illegible]
Vallois, H., 3053, page 360.
Vancheswara Iyer, S., 732.
VanDemark, N. L., 619, 1434, 2116.
Vandeplassche, M., 2109.
Vannotti, A., 1078.
Vannovskii, T. N., 3137.
Vardaman, T. H., 3687.
Vařejka, F., 461.
Varela, G., 2867.
Varges, W., 155.
Vartiovaara, U., 592.
Vaufrey, R., 3053, page 360.
Vawser, E. L., 1803.
de Vaux-Saint-Cyr, C., 849.
Veeraraghavan, N., 820.
Velazquez Echegaray, A., 1952.
Velho, E. L., 3804.
Velling, G., 1725.
Velu, P., 2135.
Vendargon, X. A., 1053, 3006.
Venkataramaiah, P., 1762.
Venkataraman, V., 827.
Venn, J. A. J., 2287.
Veretennikoff, S., 3810.
Verga, G., 2352.
Verge, J., 1192, 1543, 2312, 2513, 3716.
Vertinski, K. I., 2549.
Verwer, M. A. J., 225.
Vesselinovitch, S. D., 563.
Vetere, L., 1234.
Vetterlein, W., 2264.
Vialat, C., 2864.
Vianello, G., 1686.
Vicenzoni, V., 1686.
Victor, J., 3153.
Vieu, J.-F., 2550.
Vieuchange, J., 1955, 2864.
Vigue, R. F., 1368, 1483, 1738.
Villanyi, J., 3199.
Villee, C. A., 3339, page 410.
Villegas, C., 1172.
Villella, J. B., 2342.
Villemin, M., 3659.
Vilner, A. M., 3037.
Vindel Caurin, J. A., 3707.
Virat, B., 7, 118, 464, 1639, 1642, 1643, 2307.
Viret, J., 3053, page 360.
Vishker, A. S., 2577.
Visscher, M. B., 1356, 3570.
Visser, J., 3972.
Visser, J. H., 3000.
Vitale, J. J., 2965.
Vittoz, R., 418, 2255.
Vivell, O., 1271.
Vöhringer, K., 3991.
Vogel, F. S., 465.
Vogel, G., 2428.
Voigt, A., 1180, 2218, 2327.
Voigtlander, H. P., Jr., 3980.
Voinov, S. I., 3446.
Volik, E. K., 1889, 1989.
Volkert, M., 1653, 1654.
Volkova, A. D., 3531.
Voloskov, P. A., 934.
Van De Voorde, H., 591.
Voronin, I. I., 3467.
Vrtiak, J., 883.
Vrzgula, L., 883, 2935.
Vyshelesskii, S. N., 2526.

Wachnik, Z., 110.
Wada, S., 3616.
Wagener, K., 12, 2606, 3045.
Wagner, M., 2363, 3625.
Waibel, P. E., 238, 2706.
Wainfan, E., 415.
Waksman, B. H., 141, 3946.
Waldmann, O., 2257, 2258.
Waldron, C. A., 1912.
Walker, D. G., 2708.
Walker, D. M., 2669.
Walker, E., 1561.
Walker, G. W., 576, 1395.
Walker, J., 1568.
Walker, R. V. L., 3177.
Wallace, H. D., 3929.
Waller, E. F., 2820.
Walshe, S. L. H., 666, 667.
Walters, S. R., 1239.
Walzberg, U., 1525.
Walzl, H., 1598.
Wang, S. C., 267.
Wannan, J. S., 756, 1884, 1885.
Wannemacher, R. W., 2652.
Warner, A. C. I., 3546, 3547.
Warrack, G. H., 1996.
Warren, E. P., 2446.
Warren, F. L., 1416.
Warren, J., 3763.
Wartenberg, L., 3667.
Washko, F. V., 443, 3593.
Wasserman, B., 848.
Wasserman, R. H., 3007, 3265.
Watanabe, M., 789, 790, 791, 792, 793, 794, 795, 2180.
Waterhouse, C. E., 207.
Waters, N. F., 2132, 2951.
Waterworth, P. M., 3664.
Watkin, J. E., 1399.

Watkins, T. I., 3752.
Watson, H. J. C., 784.
Watson, J. D., 2912.
Watts, P. S., 1808, 2555.
Waugh, R. K., 921, 2106.
van Waveren, G. M., 126, 471, 819, 2881, 3798.
van Waveren, H. G., 2545.
Weaver, A. D., 351.
Weaver, B. M. Q., 3269.
Weaver, J. A., 1005.
Weber, T. B., 504.
Weber, W., 689.
Webster, H. D., 3369.
Webster, W., 939, 3067.
Webster, W. M., 391.
Weddell, W., 3473.
Wędrychowicz, S., 54, 928.
Wedum, A. G., 3735.
Weed, W. A., 1508.
v. Weerden, E. J., 3893.
Wehmeyer, P., 1604.
Weidenmüller, H., 847.
Weidlich, N., 361.
Weigle, W. O., 2625.
Weil-Malherbe, H., 3271.
Weinbach, E. C., 3197.
Weinman, D., 3440.
Weinstein, S., 2113.
Weinstein, S. B., 16.
Weipers, M., 918.
Weis, J., 2691.
Weiser, R. S., 3684.
Weiss, D. W., 1858.
Weiss, E., 3821.
Weiss, H. S., 3597.
Weiss, H. T., 182.
Weiss, J. M., 1013.
Weiss, K., 379.
Weiss, K. E., 3240.
Weitz, B., 1669.
Welch, H., 3958.
Weld, J. T., 425.
Wellmann, G., 2500, 2501.
Wells, C. W., 86, 1836, 2863, 3450.
Wells, K. F., 3391.
Welsh, M., 3453.
Werda, K., 219.
Werle, E., 170.
Werner, C., 1022.
West, G. B., 1421.
West, J. L., 841, 1976, 3033.
Westgarth, D. R., 3451.
Westhues, M., 2702, page 410.
Westman, A., 3975.
Westphal, W., 2428, 3378.
Wetmore, P. W., 3691.
Weyer, F., 2322.
Whaler, B. C., 3288.
Wharton, R. H., 2018.
Wheeler, C. E., 3791.
White, E. G., 885.
White, I. G., 1430, 1431, 1436.
White, J. S., 1291.
White, P. R., 1476.
White, R. G., 486.
White, R. W., 2560.
Whitehair, C. K., 192.
Whitehouse, R. H., 1469.
Whiting, F., 2747.
Whitlock, H. V., 3525.
Whitlock, J. H., 2049, 2345.
Whitney, I. B., 2703.
Whitney, J. C., 2060.
Whittem, J. H., 2306.
Whitten, L. K., 169, 2340, 2411.
Whittlestone, P., 456, 457, 459.
Whitty, B. T., 1637.
Wichmann, R. W., 3920.
Wickham, N., 1558, 1559.
Widdas, W. F., 914, 915.
Widdicombe, J. G., 264, 600, 3287, 3288.
Widdowson, E. M., 522.
Wieringa, G. W., 2510.
Wiesner, E., 182, 1692.
Wigmore, J. O., 1224.
Widik, R. W., 771.
Wijewanta, E. A., 3539.
Wijverkens, H., 974.
Wilbur, J. L., Jr., 3106.
Wilczyński, M., 1749.
Wild, F., 1468.
Wilde, J. K. H., 450.
Wilding, J. L., 230, 569.
Wilkins, J. H., 2081.
Wilkins, J. R., 3266.
Wilkinson, P. R., 1313, 1675.
Wilkinson, W. S., 1823.
Willett, E. L., 1897, 2436.
Williams, A. A., 3143.
Williams, E. I., 1741.
Williams, H. E., 664.
Williams, J. A., 1733.
Williams, J. E., 1151, 3383, 3384.
Williams, J. N., Jr., 3556.
Williams, J. S., 873.
Williams, J. W., 3418.
Williams, L. F., 1171, 1561, 3062.
Williams, L. W., 3226.
Williams, M. A., 2970.
Williams, R. C., 1802.
Williams, R. T., 325.
Williams, W. J., 3780.
Williamson, A. P., 467, 2901.
Williamson, J., 2568.
Willmott, S., 1319.
Wills, F. K., 796, 3501.
Wills, G., 3486.
Wilsdon, A. J., 1569.
Wilson, C., 2792.
Wilson, C. D., 677.
Wilson, C. O., 1081.
Wilson, G. D., 1823.
Wilson, G. S., 1090.
Wilson, H., 3948.
Wilson, J. B., 2195, 2221.
Wilson, J. E., 1152.
Wilson, M. M., 1512.
Wilson, P. W., 2195.
Wilson, W. O., 308, 2750.
Wiltbank, J. N., 2452.
Wilwerth, A. M., 3579.
Winn, J. F., 1238, 2274.
Winner, H. I., 2826.
Winter, L. B., 1664.
Winter, W. D., Jr., 2825.
Winterfield, R. W., 2313.
Winterhalter, M., 2934.
Winteringham, F. P. W., 491, 970.
Winton, B., 2952.
Wintrobe, M. M., 1359, 2038, 2367, 2968, 3559, 3561.
Wirtschafter, Z. T., 2708.
Wise, G. H., 921, 2039.
Wiseman, J. S., 818.
Wiseman, R. F., 3094.
Wiseman, R. W., 3884.
Wishart, D. S., 2735.
Wiśniowski, J., 377, 2532, 3104.
With, T. K., 1044, 1481.
Witschard, A., 777.
Witter, J. F., 402.
Wittke, G., 252.
Wix, P., 1131.
Woernle, H., 1273, 1274.
Wohanka, K., 298, 1562, 2217.
Wolbach, R. A., 1002.
Wolbach, S. B., 1363.
Wołoszyn, S., 2544.
Wood, A. J., 2419, 2420.
Wood, E. C., 980.
Wood, P. C., 1521.
Wood, W. B., Jr., 3670, 3671.
Woodbine, M., 1131.
Woodford, M. H., 2287.
Woodroofe, G. M., 3488, 3489.
Woodrow, C. E., 1265.
Woodward, G. T., 2032.
Woodward, J. M., 775, 2540.
Woodward, R. R., 2453.
Woolfe, G., 3752.
Worden, A. N., 207, 980, 1698, 1699.
Worseck, M., 3056, 3662.
Worstell, D., 1016.
Woszczyński, Z., 2813.
Wrenshall, G. A., 2963.
Wright, B. S., 2894.
Wright, D. E., 191.
Wright, E., 528, 542, 2037.
Wright, E. A., 387.
Wright, G. G., 337.
Wright, G. Payling., 3186.
Wright, H. V., 1727, 2371.
Wright, M. M., 180.
Wright, P., 1302.
Wright, R. D., 2417.
Wunderly, C., 1086.
Wunner, H., 3158.
Wurz, L., 1293.
Wyant, Z. N., 503.
Wyman, L., 1188.
Wynne, E. S., 2649.
Wynne, K. N., 2969.
Wynohradnyk, V., 1516, 2296.

Yabe, N., 2490.
Yakovlev, T. G., 2267.
Yamagiwa, S., 3459.
Yamaguchi, M., 1113, 2174, 2298.
Yamamoto, H., 2996.
Yamamoto, R., 1206, 2565, 2835, 3425, 3746.
Yamamoto, S. 1936, 3166.
Yamano, T., 1390.
Yamashita, J., 553, 2379.
Yamauchi, M., 793, 2451.
Yanagawa, R., 1170, 2206.
Yancy, F. S., 1611, 3499.
Yarnukh, V. S., 1280.
Yasin, S. A., 30.
Yates, V. J., 848, 1282.
Yaw, K. E., 2186.
Yazuikova, K. N., 3467, 3782.
Yeates, N. T. M., 1410.
Yeck, R. G., 1016, 3273, 3274.
Yevich, P., 3813.
Yokoyama, K., 1874.
Yonemura T., 1241, 1341, 2996.
Young, F. J., 533.
Young, G. A., 837, 1971.
Young, G. B., 305.
Young, R. J., 1108, 3356.
Young, S., 3370.
Young, W. C., 1054.
Yuskovets, M. K., 1539, 2525, 3712.

Zacher, J., 18.
Zacouto, F., 2097.
Zadara, V. I., 3393.
Zadura, J., 232, 2990.
Zagaevski, I. S., 2823.
Zaharija, I., 3722.
Zaki, O., 2064.
Zander, D. V., 46.
Zantinga, J. T., 1122.
Zappasodi, P., 702.
Zaprzał, K., 1919.
Zavadil, R., 506.
Zebrowski, L., 92, 2905.
Żebrowski, S., 721.
Zeit, W., 3625.
Zeljiko, M., 353.
Zeller, R., 1768, 2395.
Zenšek, Z., 2975.
Zettl, K., 2518, 3710.
Zhalobovski, I. L., 2850.
Zhigailov, L. S., 1135.
Zhovanik, P. N., 3392, 3393.
Zhuravleva, L. V., 1889.
Ziegenhagen, G., 1336, 2025, 2654, 3220, 3221.
Zietzschmann, O., 328.
Zillig, W., 117.
Zimmerman, H. M., 172, 3417.
Zimmermann, A., 3631.
Zimmermann, T., 2257, 2258.
Zinichenko, I. I., 3201.
Zin'kova, Z. V., 1133.
Zintz, G., 1563.
Zinzius, J., 2469.
Zirkle, R. E., 1077.
Zlotnik, I., 401.
Zolotarev, N. A., 3137.
Zontine, W. J., 2406.
Zórawski, C., 92.
Zorina, N. R., 1519.
Zrenner, K., 3158.
Zubillaga, Z. C., 2553.
Zucker, L. M., 352, 3909, 3910.
Zucker, T. F., 352, 3909, 3910.
Zuckerman, S., 606, 1085.
Zuffa, 2891.
Zuffa, A., 2904.
Zuijdam, D. M., 126.
Zuliani, F., 3096.
Zumbro, P. B., 376.
Zureck, F., 2377.
van Zwanenberg, D. F., 3354.
Zwemer, R. L., 3279.
Zwiep, N., 803, 804.

SUBJECT INDEX

The index is constructed fundamentally from the titles of articles, which may not indicate all the points of interest in the abstract or original. Readers should therefore always search the main headings and the " general " sub-headings for points of special interest:—*e.g.* for references to the control of bovine brucellosis, see " Brucella Infection, general " and " Brucella Infection, in cattle " in addition to "Brucella Infection, control ". General headings should also be searched for particular parasites. For drug treatment, see under the name of condition treated.

[The number refers to abstracts and not to pages]

A

ABATTOIRS & SLAUGHTER. Emergency slaughter, **647**; electric stunning of sheep, **3036**.
See also reports, Union of South Africa.

ABORTION, GENERAL. In cattle, caused by fungi, **1189**; epizootic bovine abortion associated with foetal liver lesions, **3245**.
See also Aspergillus; Bacteroides; Brucella Infection; Erysipelothrix (Listeria) Monocytogenes Infection; Erysipelothrix Rhusiopathiae Infection; Leptospira Infection, cattle; swine; Pox Diseases, sheep pox; Pseudomonas; Psittacosis-Lymphogranuloma Group; Rhinitis, Porcine Atrophic; Salmonella Abortus—Equi Infection; Salmonella Abortus—Ovis Infection; Staphylococcus Infection; Streptococcus Infection, horses; Trichomonas Infection, cattle; Vibrio Fetus Infection.

ABORTION, EQUINE VIRUS. In mares, **826**; acquired immunity, **1621**; chick embryo culture, **1622**; in vitro susceptibility of horse tissue, **2280**; **2601**; propagation in hamsters, **2281**; c.f. reaction, **2875**; agglutination of horse erythrocytes with infected hamster tissue extracts, **2876**; immunological relationship with equine influenza, **2877**; serological differentiation from human and swine influenza, mumps and Newcastle disease, **2878**; in the Ukraine, **3467**; causing hepatitis in hamsters, **3468**.

ABORTION, OVINE VIRUS. Aetiology, epidemiology and diagnosis, **1249-1250**; human laboratory infection, **1626**; formol vaccine, **3792**; chloramphenicol treatment, **3793**.

ABSIDIA. See Fungi, General.

ACACIA. See Poisoning, plants.

ACCLIMATIZATION & CLIMATE. See Temperature; Zootechny.

ACETATES. See Blood, composition.

ACETONAEMIA. See Ketosis.

ACETONURIA. See Ketosis.

ACETYLCHOLINE. In mares' milk, and intestinal motility, **195**.

ACHONDROPLASIA. See Bones, diseases.

ACORNS. See Poisoning, plants.

ACRIDINES. Antiviral activity against Eastern equine encephalomyelitis, Rift Valley fever, mouse psittacosis and chick embryo lymphogranuloma venereum, **3464**.

ACRIFLAVINE. See Eimeria Infection, general.

ACTINOBACILLUS. As cause of non-specific reaction to tuberculin test, **1914**; isoniazid treatment, in a cow, **2557**; cultural characteristics of selected strains of A. lignieresi, **3418**; lingual infection in a dog, **3739**.

ACTINOMYCES ASTEROIDES. As cause of bovine pharyngeal and pulmonary lesions, **2830**.

ACTINOMYCES CONGOLENSIS. See "Streptothricosis."

ACTINOMYCES DERMATONOMUS INFECTION. See "Streptomycosis."

ACTINOMYCES ISRAELI. Experimental visceral infection in mice, **1912**; erythromycin treatment, **3738**.

ACTINOMYCETACEAE. Commensalism in cultures, **1201**; mutual antagonism, **1913**.

ACTINOMYCIN. See Anaemia, Equine Infectious.

"ACTINOMYCOSIS," MAMMARY. See Corynebacterium Infection, swine.

ACUARIA. Histopathology of lesions in the gizzard, **164**.

ADENOSINE TRIPHOSPHATE. See Adrenal Gland, medullary hormones.

ADIPOXANTHOSIS (YELLOW FAT). See Yellow Fat.

ADRENAL GLAND.
General. Adrenal haemorrhages in newborn goats and foals, and stress syndrome, **559**; the pituitary and adrenal glands in chronic nephritis of dogs, **1386**; distribution and metabolism of adrenergic mediators, **1421**; dystrophic calcification in monkeys, cats and dogs, **2668**;
See also Neoplasms; Syncope, Fatal, of Pigs.
Cortical hormones. New cortical steroid, **250**; cortical hormones in sheep plasma, **261**; effect on fatty acid synthesis in mammary gland slices, **525**; "prednisone" for dog eczema, **1780**; effect on wool, **2085**; role of adrenal cortex in nephrocalcinosis, **3899**.
See also Ketosis.
Medullary hormones (adrenalin). Effect of epirenamin on body temperature, **2084**; adenosine triphosphate in the adrenal medulla in the cow, **2729**; effect of adrenalin on resistance to toxic agents in ectomized rats, **2999**.
See also Anaemia, Equine Infectious; Brucella Infection, general.

ADRENOCORTICOTROPHIC HORMONE (A.C.T.H.). Use in cattle, **2413**.
See also Ketosis; Liver, diseases; Pituitary gland; Rabies, general.

AEDES. See Dirofilaria.

AEGYPTIANELLA. A. pullorum infection in ducks, **2586**.

AEROSOLS. See Disinfection and Disinfectants; Parasiticides.

AFRICAN SWINE FEVER. See Swine Fever, African.

AGALACTIA, CONTAGIOUS, OF SHEEP AND GOATS. Prophylaxis and epidemiology, **408-409**; relationship with "oedema disease" in goats in Greece, **410**; survival and virulence of freeze-dried culture, **781**; immunization by i/d inj. of live organisms, **1578**.
See also Pleuro-Pneumonia Group.

AGE. See Hygiene, livestock; Newcastle Disease, immunology.

AIR, GENERAL. See Bacteria, General; Respiratory System, general.

AIR POLLUTION. Ammonia anti-smog bottle, **1024**; ammonia content of air associated with equine lesions resembling summer sores, **2985**.
See also Poisoning, general.

ALDRIN. See Parasiticides; Poisoning, organic.

ALGERIA. See Reports; Toxoplasma Infection.

ALLANTOIC & AMNIOTIC MEMBRANES & FLUIDS. See Embryos, Mammalian, and Foetuses; Growth, general; Pregnancy, general; Viruses, General.

ALOPECIA. See Trichophyton.

ALUMINIUM HYDROXIDE. Effect of i/p inj. in mice, **1665**.
See also Foot and Mouth Disease, immunology; Newcastle Disease, immunology; Swine Fever.

AMBLYOMMA. See Ticks, Ixodidae.

AMINO ACIDS. See Bacterium Coli; Blood, composition; Digestive System, ruminant digestion; Liver, diseases; Pteroylglutamic Acid; Vitamins, vitamin E.

AMINOACRIQUINE. See Theileria Infection.

AMINONITROTHIAZOLE. See Moulting.

AMMONIA. See Air Pollution; Magnesium.

AMYLASE. See Milk and Milk Products.

ANAEMIA, EQUINE INFECTIOUS. Level of cold haemagglutinins, **92**; nitromin and chloramphenicol treatment, **93**; in Colombia, **449**; transmission to sheep, **824**; **1961**; in man, **825**; effect of atropine and adrenalin on latent infection, **1240**; **3155**; histopathology, **1241**; presence of Heinz bodies, **1242**; structural changes in r.b.c., **1620**; actinomycin, fermicidin and chromomycin treatment, **1959**; swamp fever, **1960**; in Mexico, **2867**; c.f. test, antigen and characteristics of serum fractions, **2868-2874**; significance of soventol reaction, **3465**; attempted transmission to lambs and pigs, **3466**; Coombs test, **3781**; biological test on pigeons, **3782**.

ANAEMIA, FELINE INFECTIOUS. A study, **1978**; diagnosis and treatment, **3129**.
See also Anaemia, General.
ANAEMIA, GENERAL. Studies in pigs, **198**; treatment in piglets, **534**; marrow biopsy in sheep, **919**; in piglets, **953**; erythrocyte count in nutritional anaemia in piglets, **1358**; of unknown cause in cattle, **1746**; drug-induced, in fowls, **1779**; transmissible form in Malayan livestock ("R disease"), **3248**; in cats, **3251**.
See also Bartonella; Copper; Fasciola; Haemolytic Diseases; Poisoning, organic.
ANAESTHESIA AND ANALGESIA. Thiopentone sodium for pigs, **251**; thiobarbitone for smallpox vaccine calves, **445**; oxygen-volatilized ether for horses, **594**; of horns and ear muscles in cattle, **595**; permeability of the canine dura mater for procaine, **596**; thiambutene—malorphine antagonism in dogs, **597**; anatomical basis of nerve anaesthesia, **988**; **3626**; action of anaesthetics revealed by electrocardiogram, **989**; a plea for simplicity of apparatus, **1060**; addition of hyaluronidase to local anaesthetics, **1406**; thiambutene-thiopentone in hysterectomy in bitches, **1407**; safe anaesthesia, **1783**; synergistic action of chlorpromazine and thiopentone in horses, **1784**; procaine nerve-block—epipleural block, **2715**; **2716**; general anaesthesia in birds, **2717**; avertin (bromethol) for capturing wild animals and birds, **2718**; preliminary trials of segmental epidural anaesthesia in cattle, **3011**; chlorpromazine hydrochloride for dogs, **3269**; barbiturate antagonism: effect of "megimide" and "daptazole" on "nembutal" anaesthesia and intoxication in sheep, **3627**.
See also Colic; Mammary Gland.
ANAPLASMA INFECTION. Histochemistry of A. marginale, **76**; antigen production and c.f. reaction in cattle, **433**; use of antibiotics, **434**; in sheep in the U.S.A., **1220**; in Turkmenistan, **2250**; in France, **2582**; **3139**; c.f. test, **3140**; **3435**; spirotrypan treatment in cattle, **3141**; exp. studies in sheep and goats, **3436**; transmission, **3437**; prevention and treatment, **3438**; chloroquine treatment, **3762**.
ANCYLOSTOMA. Development of larvae in chick embryos, **1321**; phenothiazine therapy in dogs, **2936**; effect of immune serum on proteolytic action of extracts and effect of extracts on blood coagulation, **2937-2938**.
ANEURYSMS. See Circulatory System, vessels; Poisoning, plants.
ANGOLA. See Aujeszky's Disease; Pleuro-Pneumonia, Bovine Contagious; Swine Fever, African.
ANTHELMINTICS.
General. Preliminary trials with piperazine adipate, **156**; control of lungworms by aerosols, **490**; **1325**; piperazine dilaurate, **1329**; **2348**; anthelmintic studies, **1334**; piperazine citrate, **2017**; piperazine against setaria in ruminants, **2349-2350**.
See also Nematodiasis, Cerebrospinal; Parasiticides; Phenothiazine.
For cattle. Evaluation of tetrachlorethylene, **168**; hetrazan treatment of ascariasis, **1326**; tetrachlorethylene against T. axei, **3206**.
See also Anthelmintics, general; Phenothiazine.
For dogs and cats. Incidence and treatment of hookworms and ascarids, in dogs, **157**; piperazine citrate for dogs and cats, **1688**; piperazine adipate against ascaris and hookworms, **3213**.
For horses. Tests with piperazine adipate, **879**; effect of piperazine adipate on ascarids, strongyles and oxyurids, **1686**; screening tests of various compounds against horse strongyle larvae in vitro, **2343**; toluene against ascariasis in foals, **2943**; assessment of piperazine compounds, **2949**; piperazine-1-carbodithioic acid against A. equorum, **3529**; sodium fluosilicate, **3531**.
See also Phenothiazine; Setaria.
For poultry. Piperazine citrate, **507**; petrol for the treatment of A. galli, **508**; piperazine adipate against Ascaridia and Capillaria in pigeons, **1330**; barium potassium antimonyl tartrate against syngamosis, **1682**; proteolytic enzymes, **1689**; di-n-butyl tin dilaurate against Raillietina cesticillus, Choanotaenia infundibulum, Davainea proglottina and Hymenolepis carioca, **3203**; **3850**; hexachlorophene against tapeworms, **3202**; effect of nicarbazin against A. galli and pig ascarids, **3215**; piperazine derivatives against A. galli, **3533**.
For sheep and goats. Emetine hydrochloride against lungworms, **162**; **884**; control of parasitic gastroenteritis in goats, **882**; tetrachlorethylene against Trichostrongylus axei, **1681**; treatment of lungworms by intratracheal application of drugs, **1683**; dosing in Scottish hill sheep, **1687**; tetrachlorethylene for sheep, **3208**; piperazine dithiocarbamate, **3855**; testing of two piperazine compounds, **3856**.
See also Anthelmintics, general; Carbon Tetrachloride; Phenothiazine.
For swine. Effect of piperazine hydrochloride on A. suum larvae, **886**; sodium fluosilicate against pig ascarids, **1327**; **3530**; evaluation of ascaricides, **2347**; **2944**; critical tests with piperazine, **3212**; **3860**; effect of nicarbazin against fowl and pig ascarids, **3215**; present-day trends, **3532**.
ANTHRAX. See Bacillus Anthracis Infection.
ANTIBIOTICS, GENERAL. Harmful effects, **985**; **2469**; rapid determination in one drop of fermentation fluid, **1826**; a new antibiotic of bact. origin, **2081**; use in veterinary medicine, **3945**.
See also Anaemia, Equine Infectious; Anaplasma Infection; Bacillus Anthracis Infection; Bacterium Coli; Bloat; Books, nutrition; Built-up Litter; Chronic Respiratory Disease; Corynebacterium Infection, general; Coryza, Avian; Diarrhoea; Digestive System, intestines; Erysipelothrix Rhusiopathiae Infection; Fungi, General; Genital System, uterus; Growth, growth factors; Hygiene, food; Immunology, general; Leptospira Infection, cattle; Mastitis, Bovine, treatment; Milk and Milk Products; Newcastle Disease, immunology; Oxysteroids; Pfeifferella Whitmori Infection; Pleuro-Pneumonia Group; Pneumonia, Porcine Virus; Pneumonitis, Feline; Pneumonitis, Mouse Virus; Rickettsia Infection, dogs; Salmonella Gallinarum Infection; Staphylococcus Infection; Sterility, cattle; Vibrio Fetus Infection; Wounds.
For references to individual antibiotics see under specific name concerned, *e.g.*, Penicillin, Streptomycin, etc.
ANTIHISTAMINES. See Histamines.
ANTIMYCOTICS. See Fungicides.
ANTIPYRINE (PHENAZONE). See Water.
ANTRYCIDE. See Trichomonas Infection, cattle; Trypanosoma Infection, general; cattle; horses.
A.N.T.U. (ALPHA-NAPHTHYL THIOUREA). Particle size and toxicity, **1021**.
ARCTIC AND ANTARCTIC REGIONS. See Trichinella.
ARGENTINA. See Foot and Mouth Disease, immunology; Myxomatosis; Reports, international.
ARSENICAL COMPOUNDS. See Pleuro-Pneumonia Group; Poisoning, inorganic.
ARSONIC ACID. See Growth, growth factors.
ARTERIOSCLEROSIS. See Circulatory System, vessels;
ARTHRITIS. See Erysipelothrix Rhusiopathiae Infection; Joints; Tendovaginitis-Arthritis Syndrome of Fowls.
ARTHROPOD PARASITES, GENERAL. Transmission of viruses, **479**; **1991**; aerosol control, **490**; insect control by sexual sterilization, **867-869**; in C.S.I.R.O. report, Australia, **1472**.
See also Encephalomyelitis, Equine; Haematuria, Bovine Chronic; Parasiticides; Stomatitis, Vesicular; Technique and Apparatus, parasitological.
For references to individual arthropods see under names of species concerned.
ARTHUS-SACHAROW PHENOMENON. See Immunology, general.
ARUM MACULATUM. See Poisoning, plants.
ASCARIDIA. Immunity and tolerance in fowls, **1684**; effect of removal of ovum shell on infectivity of larvae, **2945**.
See also Anthelmintics, for poultry.
ASCARIS. Development of A. vitulorum, **163**; in calves in India and hetrazan treatment, **1326**; viability of eggs in sewage, **1328**; **2942**; blood picture in calves infected with Neoascaris vitulorum, **2643**.
See also Anthelmintics.
ASCHHEIM-ZONDEK TEST. See Pregnancy, diagnosis.
ASPERGILLUS. A. fumigatus infection in fowls following caponization, **402**; A. fumigatus and Rhizopus equinus from aborted bovine foetuses, **2231**; bovine pulmonary infection, **2829**.
See also Fungi, General.
ASSES. See Horses, Donkeys and Mules.
ASTEROCOCCUS. See Pleuro-Pneumonia, Bovine Contagious.
ATALAYA HEMIGLAUCA (WHITEWOOD). See Poisoning, plants.
ATAXIA. Hereditary feline cerebellar ataxia, **1458**.
See also Copper.
ATHEROMA. See Circulatory System, vessels.
ATOMIC BOMBS. See Radiations.
ATROPINE. See Anaemia, Equine Infectious.
AUJESZKY'S DISEASE. In pigs and a dog in Portugal, **84** and **85**; immunization with virus inactivated by ultraviolet light, **816**; action of aureomycin on virus, **817**; physiological changes in infected sympathetic ganglia, **1606**; action of some factors on virus, **1607**; tissue culture, **1608**; vaccination, **1609**; variation in cytopathogenicity of virus, **1946**; effect of hibernation, **1947-1948**; interference between virus variants in tissue culture, **1949**; aluminium hydroxide vaccine, **1950**; in Angola, **2266**; vaccination of pigs, **2267**; survival of free virus, **3448**; pathology in dogs, **3449**.
AUREOMYCIN. See Chlortetracycline.
AUSTRALIA. See Babesia Infection; Catarrh, Bovine Malignant; Cobalt; Copper; Corynebacterium Infection, horses; Diseases, General; Fasciola; Growth, general; Hepatocystis; Leptospira Infection, swine; Mycobacterium Johnei Infection; Myxomatosis; Phosphorus;

AUSTRALIA—[cont'd]
Pleuro-Pneumonia, Bovine Contagious; Reports; Research Institutes; Salmonella Infection, general; Ticks, Ixodidae; Trichomonas Infection, cattle.
AUSTRALORBIS. Effect of pentachlorophenol on metabolism of A. glabratus, **3197**; molluscicides for control of A. glabratus, **3847**.
AUSTRIA. See Brucella Infection, cattle; Setaria.

B

BABESIA CABALLI. See Babesia Infection, general.
BABESIA INFECTION.
General. In mongoose, **432**; "berenil" treatment, **1218-1219**; **2248**; viability of B. caballi in Hyalomma plumbeum, **1593**; in Rh. bursa outside the season, **2578**; phenanthridinium compounds against B. rodhaini in mice, **2579**; treatment and control, **3433**.
Cattle. Susceptibility of British and zebu cattle in Australia, **808**; tiargen (sodium silver pentathiosulphate) treatment, **1595-1596**; latent infection, **1931**; hemosporidin treatment, **3135**; tiargen, hemosporidin and bigumal treatment, **3136**.
Horses. In foals, **1592**; tick vectors in Hungary, **1929**; in healthy foals, **1930**; hemosporidin treatment, **2246**; **2577**; tiargen, hemosporidin and bigumal treatment, **3136**.
Sheep. In Yugoslavia, **1594**; hemosporidin treatment, **2247**; Ixodes ricinus transmitting Theileria recondita and B. motasi in Germany, **3760**.
Swine. B. trautmanni in S. Rhodesia, **1217**.
BABESIA MOTASI. See Babesia Infection, sheep.
BABESIA RODHAINI. See Babesia Infection, general.
BABESIA TRAUTMANNI. See Babesia Infection, swine.
"BABESIN." See Theileria Infection.
BABOONS (PAPIO). See Hepatitis, Canine Virus.
BACILLUS ANTHRACIS INFECTION. Lethal properties of non-capsulated strains, **7**; in bone-meal fertilizer, **8**; chemical basis of virulence, **336**; **3674**; immunity, **337**; virulence and histopathology, **684-686**; isolation from bones, **687**; outbreak after use of spore vaccine, **1097**; STI vaccine, **1099**; spore vaccine, **1100**; haemagglutination test, **1101**; tetracycline treatment, **1102**; sensitivity to penicillin, in dogs, **1103**; hydrochloric acid for disinfection of skins, **1104**; virulence of Str. pneumoniae and B. anthracis for rats and g. pigs, **1187**; an antigen prepared in vitro, **1487-1489**; complications from STI vaccine, **1490**; antiserum production for precipitin test, **1491**; potency of antiserum, **1492**; selective medium, **1493**; strains suitable for vaccines, **1848**; in soil in the U.S.A., **1849**; synergic disinfectant action of ethyl alcohol and certain acids on spores, **2156-2157**; effect of antibiotics on morphology, **2158**; non-encapsulated strain vaccine, **2159**; bact. diagnosis hampered by antibiotics, **2479**; exp. pulmonary anthrax in monkeys, **2480**; immunizing aggressin from exudates of infected g. pigs, **3063**; skin test for titration of antibody and antigen, **3064**; action of certain soil-microorganisms on B. anthracis, **3673**.
BACTERIA, GENERAL. Serological identification of pathogenic intestinal bacteria, **28**; quantitative determination of micro-organisms in air, **650**; chemical action on tissues, **777**; Boshyan's theory on the nature of viruses and bacteria, **856-857**; metabolite of dimethylquinoxaline dioxide against Gram-negative organisms, **3120**; bacterial variation to sensitivity, **3121**; progress in medical bacteriology, **3122**; table of Enterobacteriaceae, **3701**; electron microscopical study of pathogenic bacteria, **3734**; microbiological safety, **3735**.
See also Books, bacteriology; Built-Up Litter; Clostridium Infection, general; Dips and Dipping; Genital System, general; Hygiene, food; Irradiation; Muscles; Neomycin; Oxysteroids; Sterility, cattle; Technique and Apparatus, bacteriological; Viomycin; Wounds.
BACTERIOPHAGE. See Bacterium Coli; Mycobacteria, General; Salmonella Cholerae-Suis; Salmonella Group; Staphylococcus Infection.
BACTERIUM COLI. Infection in man and animals, **27**; presence in genital and mammary diseases, **362**; infection in chicks, **363**; isolation of anaerogenic strain, **734**; biomycin and levomycetin in salmonellosis and colibacillosis in calves, **735**; mastitis in cattle, **1140**; treatment of mastitis in cattle, **1141**; bactericidal effect of tissues from vaccinated and unvaccinated animals, **1522**; aeration of coliform cultures, **1523**; antiserum, **1870**; multiplication following oral penicillin, as cause of death in g. pigs, **2408**; "fimbriae" and haemagglutinating activity, **2509**; experimental pyelonephritis by various bacteria, **2547**; book, biosynthesis, **2756**; sensitivity to therapeutic agents, **2788**; bovine coli- mastitis and infantile enteritis, **3093**; rapid screening method for intestinal coliform organisms, **3094**; comparison between the action of antibiotics and bacteriophage, **3095**; resistance to tyrothricin, **3096**; amino metabolism of strains, **3097**; effect on second ecdysis in horse strongyle larvae, **3204**.
See also "Bumblefoot"; Diarrhoea; Growth, growth factors.
BACTERIUM PYOSEPTICUM (VISCOSUM). Mixed infection with swine fever virus, **2886**.
BACTERIUM VISCOSUM EQUI. As cause of meningitis and rhinitis in a horse, **361**; pathogenicity for laboratory animals, **2512**.
BACTEROIDES. Causing arthritis in foals, **400**; in kangaroos, **2555**; pathogenic components of fusospirochaetal infection, **2556**; as cause of ovine abortion, **2832**.
BARBITURATES. See Anaesthesia and Analgesia.
BARIUM. Comparative study of ^{140}Ba and ^{45}Ca metabolism, **3898**.
BARIUM POTASSIUM ANTIMONYL TARTRATE. See Anthelmintics, for poultry.
BARKING. Oestrogens for suppression of barking in male dogs, **1471**; removal of vocal cords in dogs, **2138**.
BARTONELLA. In dogs in Morocco, **2566**; mechanism of anaemia in rats, **2839**.
BATS. See Hepatocystis; Rabies.
B.C.G. See Mycobacterium Tuberculosis Infection, immunology.
BDELLONYSSUS SYLVARUM. Malathion for control of the Northern fowl mite, **1674**.
BEET. See Poisoning, plants.
BECHUANALAND. See Reports.
BEHAVIOUR OF ANIMALS. Sex drive and semen production in buffaloes, **1028**; effect of androgens and caging on sexual behaviour in g. pigs, **1054**; effect of precoital stimulation in bulls on behaviour and conception rate, **1810**; automatic recording of animal behaviour in the field, **2751**; "whirling" in cage-reared dogs, **3325**; neurological factors in sexual behaviour in domestic animals, **3630**; psychology in daily practice, **3991**.
See also Pastures and Grazing.
BELGIAN CONGO. See Erysipelothrix Rhusiopathiae Infection; Filaria; Leptospira Infection, cattle; Mycobacterium Johnei Infection; Poisoning, plants; Psittacosis - Lymphogranuloma Group; Reports, Belgium; Schistosoma.
BELGIUM. See Hyperkeratosis; Reports; Rickettsia Infection, Q fever.
BENZENE HEXACHLORIDE. See Parasiticides; Poisoning, organic.
"BERENIL." A drug against trypanosomiasis and piroplasmosis, **1218-1219**; against piroplasmosis, **2248**.
BERMUDA. See Reports.
BETA PROPIOLACTONE. For inactivation of virus vaccines, **478**; in Newcastle disease vaccine, **1981**.
BETA RAYS. See Radiations.
BILE. See Liver.
BIOCHEMISTRY. See Books, chemistry and biochemistry.
BIOMYCIN. See Salmonella Infection, cattle; Theileria Infection.
BISON. See Mycobacterium Tuberculosis Infection, general.
BLACK DISEASE. See Clostridium Infection, cattle; sheep.
BLACKHEAD. See Histomonas Meleagridis Infection.
BLACKQUARTER. See Clostridium Chauvoei; Clostridium Infection, cattle; sheep.
BLASTOMYCETES. See Candida; Yeasts.
BLINDNESS. See Eyes, diseases; Vitamins, vitamin A.
BLOAT. Investigations, **908**; treatment in cattle, **909**; in relation to reticulo-ruminal motility, **1741**; factors involved in bloat, **2659**; extraction of bloat-promoting factor from red clover, **2954**; antibiotics for prevention, **3226**; a stomach tube for relieving tympanites in cattle, **3553**.
BLOOD.
General. Amount of trapped plasma in red cell of haematocrit, **1008**; serial blood sampling and injection technique, **1063**; book, blood cytology, **1479**; book, phase contrast haematology, **1480**; effect of caffeine on complement and blood coagulation, **1998**; collection from rabbits, **2135**; haematological techniques for fowls, **2136**; transport of blood and serum samples, **3042**; volume in g. pigs, **3284**; pulmonary red cell and plasma volumes and pulmonary haematocrits in dogs, **3286**; measurement of splanchnic volume in dogs, **3953**.
See also Ancylostoma; Eimeria Infection, avian; Haematuria, Bovine Chronic; Haemophilia; Iron; Nervous System, diseases; Nutrition, general; Radiations; Swine Fever; Vitamins, vitamin C.
Coagulation. Prothrombin time in domestic animals, **3285**; prothrombinaemia in man and animals, **3598**.
See also Carbon Tetrachloride.
Composition. Effect of glucose on pyruvate content in sheep, **190**; phosphorus, calcium and vitamin A content in sheep, **200**; effect of acetic, propionic and butyric acid on glucose and ketone body level in goats, **938**; serum protein in kids and calves, **1010**; urea content in cattle, **1011**; potassium content in horses, cattle, sheep and dogs, **1012**; calcium, phosphorus, glucose and cholesterol levels after s/c inj. of carbon tetrachloride, in sheep, **1402**; serum protein levels in cattle with

BLOOD—Composition—[cont'd.]
pulmonary and hepatic echinococcus and fluke, **1678-1679**; factors affecting sugar concentration in horses, **1798**; protein and vitamin content in fowls with Newcastle disease, coryza and fowl cholera, **2052**; effect of emotion and hormones on glucose and eosinophil content in horses, **2089**; fructose content in foetuses, **2720**; amino acid pattern in urine and blood of a cystinuric dog, **2960**; blood constituents in growing cattle, **3015**; electrophoresis and polarography of blood proteins in piglets, **3018**; effects of deficiency of B_{12} and copper on protoporphyrin concentration in sheep r.b.c., **3237**; blood sugar and ketone levels in sheep after intraruminal doses of acetate, propionate and butyrate, **3241**; sweating and blood catechol content in horses, **3271**; effect of high environmental temp., fasting and coryza on various constituents in chicks, **3374**; variations in iodine content in cattle and pigs, **3911**.
See also Adrenal Gland; Carbon Tetrachloride; Copper; Hypoglycaemia; Iron; Liver, diseases; Magnesium; Newcastle Disease; Parathyroid Glands; Pregnancy, diagnosis; Pregnancy Toxaemia; Temperature, environmental; Wheat Pasture Poisoning.
Corpuscles (red). Abnormal distribution in counting chambers, **313**; fragility of dog red cells, **604**.
See also Anaemia, Equine Infectious; Anaemia, General; Iron; Mycobacterium Tuberculosis Infection, diagnosis; Nutrition, general; Radiations.
Corpuscles (white). See Blood, picture; Leucosis, bovine; Lymphatic System; Mycobacterium Tuberculosis Infection, tuberculin test; Stress Syndrome; Trichomonas Infection, cattle.
Groups. In goats, **143**; erythroblastosis and blood group inheritance in rabbits, **2000**; in cattle, **2426-2427**; **3283**; **3830**; in sheep, **2917**; identification of erythrocytic antigens in goats by iso-immune sheep sera, **2918**; breed difference in iso-antibody response after use of crystal violet swine fever vaccine, **2919**; presence of antigens J, R and A in the serum of man and animals, **3831**; blood-grouping in dairy cattle improvement, **3986**.
See also Haemolytic Diseases.
Haemoglobin. Values in cattle, **603**; determination in horses, **1006**; variation in ruminants, **1416**; electrophoretic differentiation of two fractions in cattle, **2088**; methods of determination, in dog and goat, **3952**.
See also Manganese; Nutrition, general.
Haemolytic diseases. See Haemolytic Diseases.
Picture. In normal dogs, **259**; in cows, **260**, **945**; effect of cauliflower in sheep and goats, **903**; blood counts in domestic animals in the Gold Coast, **1415**; in g. pigs, **1796**; leucocyte picture and alkali reserve in farm animals, **2428**; changes associated with age in calves, **3016**; in cattle before and after rumenotomy, **3017**; bone marrow and blood picture in healthy piglets, **3588**; apparent periodic changes in body temp., blood picture and daily milk yield in cows, **3629**.
See also Ascaris; Foreign Body Syndrome, Cattle; Manganese; Mycobacterium Tuberculosis Infection, treatment; Rinderpest.
Platelets. Platelet factor for thromboplastin generation test, **1468**.
See also Genital System, oestrous cycle.
Pressure. Arterial pressure in the horse, **1418**; venous pressure in dogs, **3282**; in relation to mortality in fowls, **3597**; effect of dextraven infusion on blood pressure during shock in dogs, **3624**; plethysmograph for measurement in sheep and goats, **3649**.
Sedimentation. Rate in inclined tubes, **652**; and toxicity of intestinal content, **955**; in cattle, **1007**; of erythrocytes in irradiated dogs, **2995**.
See also Mycobacterium Johnei Infection.
Transfusion. In animals, **246**; treatment of calf diseases with maternal blood, **736**; a service for dogs, **3943**.
See also Poisoning, inorganic.
BLOWFLIES AND FLESHFLIES. Protection of sheep, **1302-1303**; **2925**; control of Cochliomyia hominivorax by release of sterilized males, **1304**; Wohlfahrtia magnifica and Hypoderma lineatum in sheep and goats in Turkey, **2334**.
"BLUE COMB." See Pullet Disease.
BLUETONGUE. Studies in the U.S.A., **98-100**; lamb losses associated with vaccination of pregnant ewes, **451**; Cyprus strain, **2290**; antigen from mouse brain, **2604**; live vaccine, **3159**.
BODY-STRIKE. See Blowflies and Fleshflies.
BONES.
General. Evaluation of density from roentgenograms, **312**; osteology and myology in mink, **1802**; in bovine fluorosis, **2400**; effect of calcium on the ovine skeleton in pregnancy and lactation, **2669**; fusion of limb bones in sheep, **2726**; pelvic anatomy in sheep with vaginal prolapse, **2740**.
See also Bacillus Anthracis Infection; Calcium; Manganese; Osteomalacia; Phosphorus; Technique, miscellaneous.
Diseases. Osteodystrophy in dogs, **537**; osteohaemochromatosis in a bullock, **556**; is avian osteomyeloscierosis a disease?, **1019**; intermedullary pinning of fractures in dogs and cats, **1067**; achondroplasia in puppies, **2745**; epiphyseal dysplasia in a dog, **3589**; multiple cartilaginous exostoses in a dog, **3864**; osteomyelitis, a cause of nervous disorders in poultry, **3933**.
See also Spinal Column.
Marrow. See Anaemia, General; Blood, picture; Fowl Paralysis and Avian Leucosis Complex.
BONE MEAL. See Bacillus Anthracis Infection.
BOOKS.
Anatomy and Histology. Microscopic anatomy of the digestive system of the chicken, **329**; Cytoarchitecture of the human brain stem, **1844**; Topographical and cytological atlas of the medulla oblongata in the pig and dog [in German], **2151**; Anatomy of the genital organs and reproduction in mammals (German), **3337**.
Bacteriology and Bact. Diseases. Annual review of microbiology IX., **1069**; Biochemical determinants of microbial diseases, **1070**; Bacterial genetics, **1071**; Bacteria in relation to milk supply, **1083**; Topley and Wilson's principles of bacteriology and immunity, **1091**; Listeriosis (German), **2467**; Studies of biosynthesis of Escherichia coli, **2756**; Relationship between human and bovine TB. (German), **3657**.
Chemistry and Biochemistry. Chemical pathology of animal pigments, **325**; Porphyrins. Their biological and chemical importance, **1078**; Textbook of organic medicinal and pharmaceutical chemistry, **1081**; Paper electrophoresis (German), **1086**.
See also Books, bacteriology; dictionaries; protozoology.
Dictionaries and Reference Books. French-English dictionary for chemists, **1088**; Scientific books, libraries and collectors, **1089**; Annual review of biochemistry vol. 25, **4008**.
Diseases, General. Foreign animal diseases, **324**; Hutyra and Marek's special pathology and therapy of domestic animals (German), **671**; Diseases of the pig and its husbandry, **1075**; Connective tissue in health and disease, **1079**; The Merck veterinary manual, **1080**; Advances in veterinary science, **1838**; Cattle fertility and sterility, **1845**; Lymphomatosis in chickens, **2358**; Neurologic examination of the dog, **2468**; Mechanism of microbial pathogenicity (Symposium), **2757**; Textbook of veterinary surgery (German), **2762**; Veterinary ophthalmology, **2763**; Diseases of cattle with special reference to diagnosis, prognosis and treatment (Italian), **3050**; Zoonoses in relation to rural health, **3051**; Histopathology of the liver (French), **3052**; Congenital stenosis of the aorta in pigs and man (Danish), **3338**; Shepherd's guide to the prevention and control of diseases of sheep, **3658**; Biology, diseases and breeding of mink (French), **3659**; Husbandry and diseases of pigs (B.V.A. publ. No. 14), **3926**; Diagnostic methods in veterinary medicine, **4002**; Clinical diagnosis of internal diseases in domestic animals (Slovak), **4004**.
Embryology. Embryology of domestic animals (German), **328**; Normal table of Xenopus laevis. Development from fertilized egg till the end of morphogenesis, **4010**.
Endocrinology. Comparative endocrinology of vertebrates, I., II., **2471**; **2761**.
Haematology. Treatise on cytology of blood cells (French), **1479**; Phase-contrast haematology (German), **1480**.
Immunology. Topley and Wilson's principles of bacteriology and immunity, **1090**; Immunology and serology, **3047**.
Meat Inspection. Ostertag's textbook of meat inspection (German), **1084**.
Microscopy. Introduction to electron microscopy, **1062**.
Miscellaneous. Artificial insemination of farm animals, **327**; Radiation biology I., **1076**; Biological effects of external X and gamma radiation I., **1077**; International review of cytology, **1082**; Sampling techniques, **1087**; The cultivation of animal and plant cells, **1476**; R.C.V.S. catalogue, **1829**; Autoradiography in biology and medicine, **1839**; Care of the hooves in cattle (Danish), **2472**; Radioisotopes in biology and agriculture, **2764**; Breeding beef cattle for unfavourable environments, **2765**; A student's manual of practical vet. microbiology (German), **3045**; Lethal factors (German), **3054**; Forensic veterinary medicine (German), **3055**; Gestation. Transaction of Conference 1955, **3339**; A dictionary of dairying, **3660**.
Mycology. The genera of fungi, **778**; A dictionary of fungi, **1474**; Atlas of fungi pathogenic for farm animals (Russian), **2758**.
Neoplasms. Advances in cancer research III., **1074**; Lymphomatosis in chickens, **2358**; Cancer in man and animals (French), **3336**.
Nutrition. Antibiotics in nutrition, **2760**; Nutrition of fowls (French), **4001**.

BOOKS—[cont'd.]
Parasitology. Mosquitoes: their bionomics and relation to disease, **1475**; Some physiological aspects and consequences of parasitism, **1477**; The natural history of tsetse flies, **2759**; Veterinary parasitology, **3048**; Applied entomology. An introductory textbook of insects in their relation to man, **3049**; Parasites and parasitism, **4000**.
Pathology. Pathological histology for veterinarians (German). **2470**; Elements of veterinary pathology (Slovak), **4003**.
Pharmacology and Materia Medica. Textbook of organic medicinal and pharmaceutical chemistry, **1081**; The dispensatory of the United States of America, **1478**; Drawbacks of antibiotics (German), **2469**; Treatment of internal diseases for veterinary practitioners (Slovak), **4005**; Terramycin (oxytetracycline), **4007**.
Physics. Advances in biological and medical physics, vols. III and IV, **1066**; **4009**.
Physiology. The techniques and significance of oestrogen determination, **1085**; Biology of bile pigments, **1481**; The hormone. Physiology, chemistry and applications, vol. III., **1840**; Annual review of physiology. Vol. XVI., **1841**; The physiology of domestic animals, **1842**; The pineal gland. A review of the physiologic literature, **1843**; Studies on fertility, **1846**; Recent developments in cell physiology (Symposium), **2150**; Shock and circulatory homeostasis (Transactions of conference), **2152**.
See also Books, protozoology.
Protozoology. Protozoology, **782**; Biochemistry and physiology of protozoa II., **1072**.
Toxicology. Poisonous plants in India, **326**; British poisonous plants, **581**; Mycotoxicoses (Russian), **3938**; The toxic plants of Western Australia, **4006**.
Viruses. Advances in virus research, vol. II, **323**; Virus and rickettsial diseases, **1994**; Principles of animal virology, **3046**.
Zoology. Treatise of zoology, vol. XII and vol. XVII. parts I and II (French), **1073** and **3053**.
See also Books, embryology.
BOOPHILUS. See Ticks, Ixodidae.
BORNA DISEASE. C.f. test, **1618**; treatment, **1619**; ocular symptoms, **2278**; epidemiology, **3154**.
BORRELIA. Mixed exp. infection in mice with B. duttoni and T. equiperdum, **3131**.
BORRELOMYCETALES. See Pleuro-Pneumonia Group.
BOTULISM. See Clostridium Botulinum Intoxication.
BRACKEN. See Poisoning, plants.
BRADSOT. See Clostridium Infection, sheep.
BRAIN. See Nervous System, brain.
BRANDING. Comparison of branding fluids, **1460**.
"BRISKET DISEASE." In cattle in Utah, **2380**.
BROMETHOL. See Anaesthesia and Analgesia.
BROMINE. See Growth, growth factors.
BRONCHITIS, AVIAN INFECTIOUS. An apparently new disease, **1282**; a similar disease in the Netherlands, **1983**; flock history after use of combined Newcastle disease-infectious bronchitis dust vaccine, **3498**; immunization, **3500**; evaluation of vaccines, **3817**.
BRONCHITIS, PARASITIC. See Cystocaulus; Dictyocaulus; Lungworms.
BRONCHO-PNEUMONIA, BOVINE. See Psittacosis-Lymphogranuloma Group.
BRONCHO-PNEUMONIA, PORCINE. Prophylaxis and treatment, **1264**.
See also Pasteurella Infection, swine; Swine Fever.
BROODINESS. See Nervous System, brain.
BRUCELLA GROUP. Nutrition, **386**; differentiation, **752**; urease activity, **753**; **1547**; Br. intermedia in Switzerland, **1166**; cultivation on "W" medium, **1537**; nucleotides and nucleic acid synthesis, **2195**; pathogenicity, **2199**; typing, **2200**; **2803**; selective medium, **2533**.
BRUCELLA INFECTION.
General. Hares as source of porcine infection, **1544**; Br. suis infection in g. pigs, **1545**; **2539**; medium for isolation from milk, **1876**; changes in peripheral nervous system, **2524**; control in farm animals, **2526**; **2527**; symposium, **2797**; in hares, **2802**; polysaccharides, **2805**; use of mycostatin for suppression of fungous growth in Brucella milk samples, **3397**; in man and animals in Poland, **3719-3720**.
Cattle. In Pakistan, **35** and **36**; control in Germany, **37**; control in Austria, **38**; control in Switzerland, **383**; control, **1155**; U.S. eradication programme, **1159**; electrophoretic examination of blood proteins in infected cattle, **1739**; eradication plan in Italy, **2798**; identification of excretors, **2799**; eradication, **3106**; control in Denmark, **3711**; eradication in the U.S.S.R., **3712**.
See also Brucella Infection, diagnosis; immunology; treatment.
Diagnosis. Complement fixation test for ovine epididymitis, caused by a brucella-like organism, **66** and **67**; rapid plate agglutination test, **377**; ring test, **378**; **1164**; semen agglutination test, **379**; examination of vaginal mucus, **743**; diagnosis, **1162**; intradermal test, **1163**; **1530**; comparison of i/d and serological tests, **1531**; antibacteriophage serum in diagnosis, **1532**; standardization of cultures for ring test, **1533**; relationship between milk ring test results and size of fat globules, **1534**; ring test with buffalo's milk, **1535**; serological and allergic methods for diagnosis in swine, **1541**; **2538**; allergic test with brucella hydrolysate, **1542**; comparison of Coombs test and agglutination test, **1546**; diagnostic value of Koslov's stain for smears, **2197**; conjunctival test, **2522**; slow c.f. test and ring test, **2523**; diagnosis of mammary infection by the whey test, **3103**; c.f. test, **3104**; Coombs test and incomplete antibodies, **3105**; ring test in goats, **3112**; tetrazolium-stained antigens, **3386**; surface-fixation methods for diagnosis, **3387-3388**; whey plate test, **3389**; whole-blood test, **3390**; comparison of blood and milk tests, **3713**;
See also Brucella Infection, immunology.
Immunology. A heat stable protective antigen, **39**; haemagglutination test in TB. and brucellosis, **56**; effect of streptomycin in vitro and in vivo, effect of adrenaline, thiamine and ascorbic acid on serological reactions, **380**; antigen content of strains of Br. abortus and Br. melitensis, **384**; concentration of vaccine, **385**; differentiation of Strain 19 and others, **744**; freeze-dried Strain 19, **745**; **3715**; live vaccine, **746**; action of monospecific sera on Br. abortus and Br. melitensis mixtures, **751**; combined Strain 19, Cl. septicum and Cl. chauvoei vaccine, **74**; Strain 19, **1156**; sero-agglutinin titre in vaccinated cattle, **1157**; interpretation of agglutination test in vaccinated cattle, **1158**; Strain 68, **1160**; M vaccine, **1161**; slide agglutination method using stained antigen, **1536**; route of inoculation and reaction to Strain 19, **1538**; trials of Strain 68, **1539**; tetrazolium reduction for evaluation of vaccine, **1540**; mass production of Strain 19, **1877**; monospecific anti-Brucella sera, **1878**; resistance to TB., in infected mice, **2170**; vaccination and revaccination, **2194**; effect of desoxycorticosterone acetate on agglutinin production, **2196**; effect of incubation at 56°C. on the agglutination reaction, **2521**; semifluid formol vaccine, **2528**; problems of immunity, **2529**; role of reticulo-endothelial system in immunity, **2530**; inactivated vaccines, **2531**; **3107**; **3108**; human infection with Strain 19, **2534**; white blood picture and serum protein content in cows immunized with Strain 19, **2800**; Strain 10/5, **2801**; interpretation of agglutination test in cattle vaccinated during calfhood, **3391**; U.I.E.V. vaccine, **3392-3393**; standardization of immunization, **3714**.
See also Brucella Infection, diagnosis.
Sheep and Goats. Epididymitis in rams in Australia, **316**; effect of mountain pasture, **381**; experimental infection in sheep with Br. abortus, **382**; transmission, pathology and suppurative form of epididymitis in rams, **1571-1574**; epididymitis in Slovakia, **1575**; control in Switzerland, **2198**; clinical description, pathology and bacteriology of ovine epididymitis, **2837-2838**; ovine and caprine infection, **3113**; serological observations in a flock, **3394**; studies on the agent of epididymitis in rams, **3419**.
See also Brucella Infection, diagnosis; Brucella Melitensis Infection; Brucella Tularensis Infection.
Swine. Br. suis from testicles of boars, **40**; research work, **748**; in France, **1543**; **3716**; relation between infection in pigs and hares, **1544**; **3111**.
See also Brucella Infection, diagnosis.
Treatment. In cattle, **747**; therapeutic—prophylactic serum, **2525**; sodium penicillin G-dihydro-streptomycin sulphate treatment, **3109**; penicillin-sensitive strains, **3110**.
BRUCELLA INTERMEDIA. See Brucella Group.
BRUCELLA MELITENSIS INFECTION. A complement-fixation test for sheep, **41**; eradication in goats, **42**; choice of strain for immunization of sheep and goats **43** and **44**; in man from goats, **45**; formolized culture, **749**; in Canadian Eskimos, **750**; selection of strains for standard Br. melitensis antigen in W. Germany, **1165**; examination of sheep, **2532**; melitin test for sheep and goats, **2535**; serology in exp. infected sheep, **2536**; immunization of sheep and goats, **2537**; susceptibility in young goats, **3395**; immunization of g. pigs with a suspension inactivated by antibiotics, **3396**; control in sheep and goats in North Rhine-Westphalia, **3717-3718**.
See also Brucella Infection, sheep and goats.
BRUCELLA SUIS. See Brucella Infection, general, swine.
BRUCELLA TULARENSIS INFECTION. In sheep and man in the U.S.A., **1879**; host-parasite relationship, **2540**; dogs and other animals as hosts and ticks as vectors, **2804**.
BUDGERIGARS. See Cnemidocoptes; Psittacosis.
BUFFALOES. See Behaviour of Animals; Brucella Infection, general; Encephalomyelitis, Bovine; Genital System, testicles; Gigantocotyle; Insemination, Artificial; Rinderpest; Semen and Spermatozoa; Sex Hormones, oestrogens; Skin, general; Thyroid Gland; Urinary System, diseases; Zootechny.
BUILT-UP LITTER. Micro-organisms, antibiotics and vitamin B_{12} content, **1023**.

BULGARIA. See Rickettsia Infection, Q fever.
"BUMBLEFOOT." Aetiology and pathogenesis, **959.**
BUTYRATE. As precursor of milk constituents, **1413.**
See also Blood, composition.
BUZZARDS. See Salmonella Infection, general.

C

CADMIUM. Tissue storage in pigs, **1403.**
CAESARIAN SECTION. In mares, **2454.**
CAFFEINE. Interstitial metabolism in rat bone and teeth, **529;** determination in biological material, **530;** binding to serum albumin, **532;** role in the reproduction of pheasants, **1357;** effect of induced hypocalcaemia on potassium toxicity, **1362;** intestinal absorption and excretion in pigs, **1713;** placental transfer in rats, **2964;** effect of low temperature and calcium on magnesium requirement, **2965;** metabolism of calcium, phosphorus and nitrogen in hypervitaminosis A in rats, **3235;** comparative study of ^{140}Ba and ^{45}Ca metabolism, **3898.**
See also Blood, composition; Bones, general; Embryos, Fowl; Kidneys, diseases; Milk Fever; Parathyroid Glands; Phosphorus.
CALCIUM VERSENATE. Against lead poisoning in cattle, **2071.**
CALCULI. See Urinary System, diseases.
CALVES. See Cattle.
CAMELS. See Pituitary Gland; Temperature, Body; Water.
CANADA. See Brucella Melitensis Infection; Mucosal Disease; Pasteurella Infection, cattle; Pfeifferella Anatipestifer Infection; Pneumonia, Porcine Virus; Rhinitis, Porcine Atrophic; Toxoplasma Infection.
CANARIES. See Plasmodium Infection, avian.
CANDIDA ALBICANS INFECTION (MONILIASIS).
General. Cortisone in murine infection, **404;** blastomycosis in a dog, **1190;** effect of nystatin (fungicidin), **1191;** effect on lymphopoiesis in mice, **1904;** mycotic mastitis in cattle, **2227;** morphological variations in the agents of blastomycosis and histoplasmosis, **2554;** renal lesions in aureomycin-treated mice, **2825.**
Avian. Moniliasis of the crop in chicks and poults, **403;** role of C. albicans in blackhead, **1215;** pentamidine treatment, **2551;** moniliasis in capercaillie, and blackhead, **2824;** immunity, **2826;** copper sulphate treatment in crop moniliasis, **3417.**
CANNIBALISM. Control in sows, **1040;** in fowls and methionine, **2663.**
CAPERCAILLIE. See Histomonas Meleagridis Infection.
CAPILLARIA. C. plica as cause of cystitis and nephritis in a dog, **153.**
See also Anthelmintics, for poultry.
CARBOHYDRATES. See Ketosis; Sugars.
CARBOMYCIN. In veterinary practice, **590.**
See also Actinomyces Israeli; Erysipelothrix Rhusiopathiae Infection; Leptospira Infection, general.
CARBON TETRACHLORIDE. Calcium, phosphorus, glucose and cholesterol blood levels after s/c inj. in sheep, **1402;** liver fluke in ruminants treated by s/c inj., **2337; 2934-2935;** effect on serum constituents and prothrombin time in cattle and sheep, **3944.**
CARCINOMA. See Neoplasms.
CARICIDE (DIETHYLCARBAMAZINE ACID CITRATE). See Setaria.
CARIES. See Teeth.
CARUNCLES. See Genital System, uterus; Pregnancy, general.
CASEIN, IODINATED. Effect on milk secretion in sows, **2975;** against "non-sweating" in horses, **3919.**
CATALASE. See Claviceps.
CATARRH, BOVINE MALIGNANT. Elementary bodies, **829;** adaptation to rabbits, **830;** differentiation from E. monocytogenes infection, **1375;** in N.S. Wales, **1625; 3156.**
CATECHOL. Blood content in sweating horses, **3271.**
CATS. See Adrenal Gland, general; Anaemia, Feline Infectious; Anaemia, General; Anthelmintics; Ataxia; Bones, general; Circulatory System, vessels; Clostridium Botulinum Intoxication; Cuterebra; Enteritis, Feline; Heredity, lethal factors; Histoplasma; Isospora Infection; Laryngo-Enteritis, Feline Infectious; Leptospira Infection; Microsporum; Myelitis, Infectious Feline; Neoplasms; Pneumonitis, Feline; Poisoning, inorganic; organic; Rhinitis, Porcine Atrophic; Sex; Toxocara; Toxoplasma Infection; Urinary System, diseases; Vitamins, vitamin B (folic acid); Vitamin B_{12}.
CAT-SCRATCH FEVER. In Great Britain, **1979.**
CATTLE.
General. See Behaviour of Animals; Blood, composition; groups; haemoglobin; picture; sedimentation; transfusion; Digestive System; Growth, general; Hump; Insemination, Artificial; Lactation; Manganese; Nutrition, general; Phosphatase; Pituitary Gland; Pregnancy, general; diagnosis; Respiratory System, general; Semen and Spermatozoa; Sex Hormones, gonadotrophins; progesterone; Sodium; Sugars; Temperature, environmental; Thyroid Gland; Vitamins, vitamin E; Water; Zootechny.
Arthropod parasites. See Mange; Oestridae; Ticks.
Bacterial and fungous diseases. See Abortion, General; Actinobacillus; Actinomyces Asteroides; Actinomyces Congolensis; Aspergillus; Brucella Infection; Clostridium Infection; Clostridium Tetani Infection; Conjunctivitis, Bovine Infectious; Corynebacterium Infection; Diarrhoea; Dysentery, Vibrionic; Erysipelothrix (Listeria) Monocytogenes Infection; Fungi, General; Fusiformis Infection; Klebsiella; Leptospira Infection; Mastitis, Bovine; Microsporum; Mycobacterium Johnei Infection; Mycobacterium Tuberculosis Infection; Pasteurella Infection; Pleuro-Pneumonia, Bovine Contagious; Pseudomonas; Salmonella Gallinarum Infection; "Senkobo Skin Disease"; Staphylococcus Infection; Sterility; Streptococcus Infection; Streptothrix; Torulopsis; Trichophyton; Vibrio Fetus Infection; Yeasts.
Diseases, general. "Non-specific" venereal infections, **300;** treatment of calf diseases with maternal blood, **736;** pneumonia-enteritis in newborn calves, **2056-2058;** book, cattle diseases, **3050.**
See also Anaemia, General; Anaesthesia and Analgesia; Bloat; Bones; "Brisket Disease"; Cobalt; Conjunctivitis, Bovine Infectious; Digestive System, ruminant digestion; Eyes; Fat Necrosis; Foreign Body Syndrome, Cattle; Genital System, placenta; uterus; Haematuria, Bovine Chronic; Haemoglobinuria, Puerperal; Heredity; Hyperkeratosis; Immunology, general; Ketosis; "Khutili" Disease; Kidneys; Leucosis, Bovine; Liver, diseases; Lymphangitis, General; Magnesium; "Manchester Wasting Disease"; Milk Fever; Milk and Milk Products; Mucosal Disease; "Muzzle Disease"; Neoplasms; Nervous System, diseases; Nutrition, in relation to disease; Nymphomania, Osteomalacia; Pica; Poisoning; Porphyria; Purines; Reports, U.S.A.; Rhinotracheitis, Infectious Bovine; Skin, disease; Spastic Syndrome; Stomatitis, General; Stress Syndrome; Thyroid Gland; Trace Elements; Venoms; Vitamins, vitamin A; vitamin C; Wheat Pasture Poisoning; White Muscle Disease.
Helminth parasites. See Anthelmintics; Ascaris; Cysticercus; Dictyocaulus; Echinococcus; Fasciola; Filaria; Gastro-Enteritis, Parasitic; Haemonchus; Helminth Parasites, General; Nematodiasis, Cerebrospinal; Nematodirus; Paramphistomum; Phenothiazine; Schistosoma; Setaria; Thelazia.
Protozoan diseases. See Anaplasma Infection; Babesia Infection; Eimeria Infection; Giardia; Sulphaquinoxaline; Theileria Infection; Trichomonas Infection; Trypanosoma Infection.
Virus and rickettsial diseases. See Catarrh, Bovine Malignant; Encephalomyelitis, Bovine; Foot and Mouth Disease; Influenza; Mucosal Disease; Muzzle Disease; Papilloma; Pox Diseases; Psittacosis-Lymphogranuloma Group; Rabies; Rickettsia Infection; Rinderpest; Sterility; Stomatitis, General; Stomatitis, Vesicular; Sweating Sickness; Three-Day Fever, Bovine; Vaginitis, Catarrhal; Viruses, General.
CAULIFLOWER. Effect on blood picture in sheep and goats, **903;** effect on thyroid gland of cattle, **904;** thiocyanates in saliva of sheep and goats following ingestion of leaves, **905.**
CELLULOSE. See Digestive System, fauna and flora.
CENTAUREA SOLSTITIALIS. See Poisoning, plants.
CEREBROSPINAL FLUID. See Nervous System.
CERVIX. See Genital System, uterus.
CESTODES. See under generic names of cestodes and also under Anthelmintics.
CETYLPYRIDIUM CHLORIDE. See Mycobacterium Tuberculosis Infection, general.
CEYLON. See Dirofilaria; Gigantocotyle; Isospora Infection.
CHELATING AGENTS. See Clostridium Welchii.
CHEMISTRY. See Books.
"CHEWING DISEASE." See Poisoning, plants.
CHIMPANZEES. See Salivary Glands.
CHINCHILLAS. Diseases and parasites, **3243.**
See also Erysipelothrix (Listeria) Monocytogenes Infection; Toxoplasma Infection.
CHLORAMINE. See Trichomonas Infection, cattle.
CHLORAMPHENICOL. Serum levels in horses, **3268.**
See also Abortion, Ovine Virus; Anaemia, Equine Infectious; Fusiformis Infection; Ophthalmia, Ovine Contagious.
CHLORDANE. See Lice; Parasiticides; Ticks, Ixodidae.
CHLORHEXIDINE. See Trichomonas Infection, cattle.
CHLORINATED NAPHTHALENES. See Hyperkeratosis; Poisoning, organic; Stomatitis, General.
CHLORINE. See Hygiene, livestock.
CHLOROMYCETIN. See Chloramphenicol.

CHLOROPHENYLGUANIDOHEXANE. See Mastitis, Bovine; Trichomonas Infection, cattle.
CHLOROQUINE. See Anaplasma Infection.
CHLORPROMAZINE (LARGACTIL). See Anaesthesia and Analgesia.
CHLORTETRACYCLINE (AUREOMYCIN). In saliva after i/m. inj., **981**; effect on bacterial infiltration and alimentary lymphoid tissue in normal rabbits, **2836**; effect on bacteriophage, **3180**.
See also Aujeszky's Disease; Candida; Cobalt; Digestive System, fauna and flora; intestines; Eggs, Hen; Growth, growth factors; Milk and Milk Products; Poisoning, therapeutic substances; Pullet Disease; Salmonella Cholerae-Suis; Salmonella Pullorum Infection; Swine Fever.
CHLORTHION. See Poisoning, organic.
CHOANOTAENIA. See Anthelmintics, for poultry.
CHOLESTEROL. Metabolism in vitro by intestinal bacteria, **415**; arteriosclerosis in birds caused by prolonged feeding with dihydrocholesterol, **524**; metabolism, **1009**.
See also Blood, composition; Immunology, complement fixation.
CHOLINE. See Digestive System, fauna and flora.
CHOLINESTERASE. Pseudocholinesterase in ruminants, **1411**.
CHORIOMENINGITIS, LYMPHOCYTIC MURINE. Virus-mouse relationship, **116**; protective effect of 300r total body irradiation, **3491**; effect of a-methopterin and guanazolo in infected mice, **3815**.
See also Poisoning, organic.
CHORIOPTES. See Mange, cattle.
CHROMIC OXIDE. See Nutrition, general.
CHROMOMYCIN. See Anaemia, Equine Infectious.
CHROMOSOMES. See Heredity, of disease.
CHRONIC RESPIRATORY DISEASE OF FOWLS. Electron microscopy of r.b.c. from infected chick embryos, **130**; slide agglutination test, **131**; effect of antibiotics, **413**; differential diagnosis and control, **850-851**; freeze-agglutination test, **1207**; response to drugs, **1208**; clinical picture, transmission and review of literature, **1579-1580**; virus from turkeys, **2319**; a similar disease in Egypt, **2562**; **3747**; observations, **2563**; **3748**; thallium acetate in diagnosis, **2564**; egg-transmitted infection in hatcheries, **2565**; serological testing, **3423**; preparation of antigen, **3746**.
CIRCULATORY SYSTEM.
General. Circulation in the giraffe, **1417**; foetal circulation in lab. animals, **3954**.
See also Cholesterol; Liver, diseases; Vitamins, vitamin E.
Heart. Duration of systole and diastole, **262**; closure of the foramen ovale in newborn lambs, **264**; cardiology in dogs, **956**; myocardial biopsy and electron microscopy, **1013**; enlargement and congestive failure in dogs, **2061**; myocardial necrosis in potassium depleted rats, **3897**; spontaneous serous endocarditis in rabbits, **3931**.
See also Anaesthesia and Analgesia; Neoplasms; Nutrition, in relation to disease; Round Heart Disease; Temperature; Torulopsis; Vitamins, vitamin E.
Vessels. Arteriosclerosis in cats, **228**; the azygos system in some mammals, **263**; direction of venous blood flow in the mammary region of sheep and goats, **265**; supply of the equine scrotum, **266**; antheroma, aortic rupture and dissecting aneurysms in turkeys, **960-961**; experimental arteriopathy, **1756**; portal vein flow in sheep, **1797**; **2090**; dissecting aortic aneurysms in cortisone-treated hamsters, **2065**; **3591**; dissecting aortic aneurysms in methonium-treated patients, **2066**; atheromas in avian arteriosclerosis, **2393**; book, congenital stenosis in man and pigs, **3338**; a "liver valve" in the vena cava of the pig, **3631**.
See also Blood, general; Cysticercus; Immunology, allergy and anaphylaxis; Liver, diseases; Periarteritis Nodosa; Poisoning, organic; Vitamins, vitamin E.
CLAVICEPS. Effect of ergothioneine and catalase on germination of Claviceps purpurea, **3618**.
See also Poisoning, plants.
CLIMATE. See Temperature.
CLOACA. Cloacitis in fowls, **1392**.
CLOSTRIDIUM BOTULINUM INTOXICATION. Susceptibility of pigs, **388**; in mink, **389**; **765**; **2819**; immunization with type C toxoid, **766**; body weight as response factor in mice, **767**; effect of ultrasonics on toxin, **768**; in horses in Spain, **1176**; avian botulism, **1177**; types A and B toxin-antitoxin reactions, **1178**; in horses, **1894**; resistance of cats to toxin, **1895**; action of tubocurarine chloride on intoxication with type C beta toxin, **3411**; protection of mink against type C toxin with type C toxoid and polyvalent antitoxin, **3412**.
CLOSTRIDIUM CHAUVOEI. Vaccine production, **1889**; survival of spores in soil, **2216**.
See also Clostridium Infection, cattle; Clostridium Infection, sheep.
CLOSTRIDIUM HAEMOLYTICUM. See Clostridium Infection, cattle.
CLOSTRIDIUM INFECTION.
General. Epidemiological data on blackleg, **2981**; antogonistic action of some soil bacteria on clostridia, **3726**.
Cattle. Cl. welchii Type B in blackleg, **48**; combined Strain 19, Cl. septicum and Cl. chauvoei vaccine, **774**; with Cl. sordellii in Gt. Britain, **1892**; "black disease" (necrotic infectious hepatitis) in a heifer, **2543**; Cl. welchii type B from lambs and calves with enterotoxaemia, **3406**; Cl. haemolyticum from liver and kidneys of healthy cattle, **3409**; Cl. haemolyticum as cause of ictero-haemorrhagic haemoglobinuria in Venezuela, **3724**.
Sheep. Aetiology of bradsot, **1175**; vaccination, **1891**; acute necrotic hepatitis caused by Cl. welchii and Cl. septicum, **2215**; bradsot in Poland, **2544**; **2813**; blackleg of the ovine foetus, **2815**; Cl. welchii type B from enterotoxaemia in lambs and calves, **3406**.
Swine. Cl. welchii type C enteritis in piglets, **1557**; **3408**; Cl. welchii type B as cause of piglet dysentery, **3407**.
See also Clostridium Botulinum Intoxication.
CLOSTRIDIUM OEDEMATIENS. A specific antigen, **763**.
CLOSTRIDIUM PERFRINGENS. See Clostridium Welchii.
CLOSTRIDIUM SEPTICUM. A study of strains, **2814**.
See also Clostridium Infection, cattle; sheep.
CLOSTRIDIUM SORDELLII. See Clostridium Infection, cattle.
CLOSTRIDIUM TETANI INFECTION (TETANUS). Protective action of toxoid, **387**; antitoxin in healthy cattle serum, **764**; aluminium-precipitated diphtheria and tetanus toxoids, **1188**; "booster" dose of toxoid in horses, **1893**; vaccination, **2816**; effect of precipitated toxoid in horses, **2817**; treatment with d-tubocurarine chloride, **2818**; agar diffusion studies of antigens in antitoxin, **3410**; large scale production of toxin, **3725**.
CLOSTRIDIUM WELCHII. A selective medium, **762**; comparison of type A toxins, **1174**; haemagglutinin in relation to other soluble antigens, **1558-1559**; effect of metallic ions, **1560**; purification of toxin, **1890**; antigenic properties of types B, C and D, **2812**; gangrene of the wings in chicks associated with diet, Cl. welchii type D and Staph. aureus, **2820**; protection against type A toxin by metal-chelating agents, **3723**.
See also Clostridium Infection, cattle; sheep; swine.
CLOVER. See Bloat; Magnesium; Poisoning, plants; Sex Hormones, oestrogens.
CNEMIDOCOPTES. Cn. pilae in budgerigars, **3194**.
COBALT. Deficiency and B_{12} intake in cattle and sheep, **197**; dosing of lambs on deficient pasture, **533**; response in deficient lambs to leucovorin and chlortetracycline, **1716**; copper and cobalt deficiency in West Australia, **1717**; prevention of swayback in sheep by copper and cobalt salts in drinking water, **2677**; deficiency and internal parasites, in sheep, **2933**; action of salts on isolated intestine, **2967**.
See also Digestive System, fauna and flora; Hypoglycaemia; Irradiation; Pancreas; Phenothiazine; Pica.
COCCIDIOIDES. C. immitis from a rabbit, **2548**.
COCCIDIOSIS. See Eimeria Infection; Isospora Infection.
COCHLIOMYIA. See Blowflies and Fleshflies.
COD-LIVER OIL. See Encephalomalacia, Avian; Nutrition, general.
COENURUS. Eradication of C. cerebralis and echinococcus in sheep, **3201**.
COLIC. Lumbar-procaine nerve block for treatment, **3552**.
COLIFORM ORGANISMS. See Bacterium Coli.
COLLAGEN. See Hyperkeratosis; Pregnancy, general.
COLOMBIA. See Anaemia, Equine Infectious.
COLOSTRUM. See Pregnancy, diagnosis.
COMMITTEES, CONFERENCES AND CONGRESSES. Conference on tropical vet. medicine and nutritional problems, held at the Dakar Federal Animal Husbandry Laboratory, **897**; canine virus forum, **1265**; Colonial Office, Trypanosomiasis and Tsetse fly Committee report, **1924**; FAO/WHO Committee on Meat Hygiene, **3634**; report, Belgian committee on sterility, **3976**.
See also Helminth Parasites, General; Mycobacterium Tuberculosis Infection, general; Reports; Salmonella Pullorum Infection; Trypanosoma Infection, general; Vitamins, vitamin B.
CONJUNCTIVITIS, BOVINE INFECTIOUS. Cortisone treatment, **1139**.
COOMBS TEST. See Anaemia, Equine Infectious; Brucella Infection, general.
COPPER. Metabolism, **1359**; in C.S.I.R.O. report, Australia, **1472**; availability in freeze-dried herbage and extracts, **1715**; copper and cobalt deficiency in West Australia, **1717**; deficiency and anaemia in swine, **2367**; nitrogenous fertilizers and blood level in cattle, **2673**; ataxia (swayback) in lambs, **2675**; deficiency in a herd, **2676**; prevention of swayback in sheep by cobalt and copper salts in drinking water, **2677**; iron metabolism in copper-deficient swine, **2968**; copper-molybdenum-sulphate inter-

COPPER—[cont'd.]
action in ovine hypocupraemia and hypocuprosis, **2969**; dietary availability in naturally occurring organic complexes, **3234**; liver and blood content in Friesian cattle, **3558**; metabolic studies, **3559**; in blood and liver of some vertebrates, **3560**; haemin chromoproteins in copper and iron deficient swine, **3561**; deficiency in sheep associated with grazing on salt marshes, **3890**; biochemistry of deficiency, **3896**.
See also Blood, composition; Growth, growth factors; Hair; Poisoning, inorganic; Wool.
COPPER SULPHATE. See Candida.
COPROPHAGY. See Faeces.
CORPORA LIBERA. In the abdominal cavity, **941**.
CORRIDOR DISEASE. See Theileria Infection.
CORTISONE. Causing changes in tissues, **986-987**; changes in rat thymus and lymph nodes, **1005**; causing aortic aneurysms in hamsters, **2065**; **3591**; cortisone-vitamin interactions, **3579**.
See also Adrenal gland, cortical hormones; Candida Albicans Infection; Conjunctivitis, Bovine Infectious; Erysipelothrix Rhusiopathiae Infection; Growth, general; Immunology, antibodies and antigens; Ketosis; Lameness; Liver, diseases; Mastitis, Bovine; Oxysteroids, General; Trichinella; Vitamins, vitamin A.
CORYNEBACTERIUM INFECTION.
General. Loss of resistance in pantothenate-deficient rats, **352**; antibody response to diphtheria toxoid in vitamin deficiency, **489**; a corynebacterial agent against staphylococcal toxin, **674**; aluminium-precipitated diphtheria and tetanus toxoids, **1188**; effect of neurotomy on skin sensitivity to diphtheria toxin, **1298**; sensitivity to antibiotics, in vitro, **1862**; C. pseudotuberculosis murium infection in mice, **2497**; thiamine, pyridoxine and pantothenic acid in natural resistance of rats, **3910**.
Cattle. Summer mastitis, **351**; **1514**; control of summer mastitis in cattle by insecticides, **1515**; C. renale as suspected cause of haematuria, and penicillin treatment, **2054**; treatment of mastitis with terramycin, **2177**.
Horses. C. equi infection in Victoria, **1512**.
Sheep and goats. C. ovis infection in goats, **715**; C. ovis infection in sheep, **1513**.
Swine. Mammary "actinomycosis," **1863**; otitis, **2178**; C. pseudopyogenes complicating swine fever, **3476**; outbreak of C. pyogenes infection, **3688**; C. pyogenes isolated from an abcess causing oesophageal compression in a pig, **3930**.
CORYZA, AVIAN. Streptomycin treatment, **26**; treatment, **1868-1869**; serum proteins and vitamin content in fowls infected with Newcastle disease, coryza and fowl cholera, **2052**.
See also Blood, composition.
COTYLEDONS. See Genital System, uterus; Pregnancy, general.
COWPOX. See Pox Diseases.
COYPU. See Streptococcus Infection, general.
CREOLIN. See Mange, sheep.
CRYPTOCOCCOSIS. See Histoplasma Farciminosum Infection.
CRYPTOSPORIDIUM. C. meleagridis from turkeys, **806**.
CULEX. See Encephalomyelitis, Equine.
CURARE. See Electric Shock.
CUTEREBRA. First-stage larva from epidural space of a cat, **3840**.
CYCLETHRIN. See Parasiticides, general.
CYPRUS. See Bluetongue; Reports.
CYSTICERCUS. "Beef measles" in Kenya, **495**; as cause of arteriosclerosis in an ox, **878**; bovine cysticercosis, human T. saginata infestation and sewage disposal in Great Britain, **2010-2011**; sewage and transmission of T. saginata from man to cattle, **2639**; epidemiology and diagnosis in cattle, **3199**.
CYSTINE. See Urinary System, diseases.
CYSTOCAULUS. C. ocreatus in sheep in Poland, **161**.
CYTOCHROME C. Therapeutic applications, **1781**.
CYTOLOGY. Pathology of virus-infected cells, **476**; international review, **1082**.
See also Radiations.
CZECHOSLOVAKIA. See Brucella Infection, sheep and goats; Man: Diseases of Animals Transmissible To and From; Salmonella Cholerae-Suis.

D

DAIRY SCIENCE. See Milk and Milk Products.
DAMALINIA. See Lice.
"DAPTAZOLE." See Anaesthesia and Analgesia.
DAVAINEA. See Anthelmintics, for poultry.
D.D.T. See Parasiticides; Poisoning, organic; Ticks, Ixodidae.
DEER. See Mucosal Disease; Periarteritis Nodosa.
DEGENERATION, MUSCULAR. See Muscles.
DEMODEX. See Mange.
DENDRODOCHIUM. See Poisoning, plants.
DENMARK. See Brucella Infection, cattle; Paralysis; Toxoplasma Infection.
DERMANYSSUS. Effect of temperature on life cycle of D. gallinae, **2634**.
DERMATITIS, CONTAGIOUS PUSTULAR. In sheep and goats, **833**; of the udder in sheep and goats, **1967**; orf in man, **2291**; microscopical study in sheep, rabbits and man, **3791**.
DERMATOPHYTES. Attacking modified keratin, **64**; preservation at sub-freezing temperatures, **779**; growth inhibition in vitro by a salicylamide derivative, **3125**.
See also Microsporum; Trichophyton.
DERRIENGUE. See Rabies.
DERRIS. See Oestridae, Hypoderma.
DESCEMET'S MEMBRANE. See Eyes.
DESOXYCORTICOSTERONE ACETATE. Effect in young chicks, **304**; effect on brucella agglutinin production, **2196**.
See also Oxysteroids, General.
DETERGENTS. And treatment of water and sewage, **3963**.
See also Growth, growth factors; Mycobacterium Tuberculosis Infection, general.
DIABETES MELLITUS. In dogs, **543**.
DIARRHOEA. Resistance of calf scours organisms to antibiotics, **1142**; epidemiology of white scours in calves, **1521**; influenza, chronic pneumonia and diarrhoea in piglets, **2691**; in laboratory mice, **3590**.
See also Bacterium Coli Infection; Dysentery, Vibrionic; Enteritis; Mucosal Disease; Pullet Disease; Vibrio Jejuni.
DIASTASE. See Enzymes, General.
DIAZINON. See Siphona; Ticks, Ixodidae.
DICROCOELIUM. Prophylaxis in sheep, **3521**.
DICTIONARIES. See Books.
DICTYOCAULUS. Effect of immune serum on D. viviparus in calves, **504**; bionomics of free-living larvae of D. viviparus and D. filaria, **505**; **3527**; parasitic bronchitis in cattle, **1324**; acquired resistance to D. viviparus in cattle, **2014**; treatment in calves, **2940**; course and pathogenicity of initial infections with D. viviparus in cattle, **3211**; control of hoose (D. viviparus), **3526**; reinfection experiments in sheep with D. filaria, **3528**.
DIELDRIN. See Oestridae, Hypoderma; Parasiticides; Poisoning, organic.
DIETHYLENE DIAMINE DILAURATE (PIPERAZINE DILAURATE). See Anthelmintics, general.
DIGESTIVE SYSTEM.
General. Book, histology of avian digestive system, **329**; permanent fistulas in cattle, **1827**; digestive enzyme system development during pre-weaning period in piglets, **2419-2420**; study on digestion in fowls, **2725**.
See also Chlortetracycline; Magnesium; Nutrition; Pastures and Grazing.
Diseases. Enterocolitis in dogs, **227**; histology of liver in avian enteritis, **958**; Hirschsprung's disease in swine, **1043**; pneumonia-enteritis in newborn calves, **2056-2058**.
See also Bacteria, General; Bloat; Candida; Cloaca; Colic; Diabetes Mellitus; Diarrhoea; Enteritis, Porcine; Foreign Body Syndrome, Cattle; Mouth; Mucosal Disease; Mycobacterium Tuberculosis Infection, general; Neoplasms; Nutrition, in relation to disease; Vibrio Jejuni.
Fauna and flora. Culture and physiology of bovine ruminal holotrichs, **81**; proteolytic bacteria in the ovine rumen, **414**; action of penicillin and aureomycin in pigs, **912**; effect of chlortetracycline on bovine ruminal microorganisms, **1345**; effect of aureomycin in g. pigs, **1777**; effect of chlortetracycline on flora of piglets obtained by hysterectomy, **1917**; ruminal ciliates, **1939**; effect of infusoricidal compounds on rumen microbes, **2254**; effect in calves of inoculation with ruminal contents, **2510**; organisms isolated from cattle fed high and low roughage diets, **2511**; occurrence of yeasts and yeast-like organisms in the rumen, **2552**; effect of dried preserved rumen inoculum on micro-organisms in lambs, **3545**; proteolysis by rumen organisms, **3546**; in vitro studies with rumen organisms, **3547**; characteristics of some rumen lactobacilli, **3749**; ruminal anaerobes, **3750**; effect of rations on pH and microflora in parts of avian intestine, **3884**; in vitro production of ammonium and amines by intestinal bacteria, **3887**; choline catabolism in pigs, by intestinal flora, **3888**; effect of cobalt on cellulose digestion by rumen organisms, **3895**.
See also Bacteria, General; Cholesterol; Growth growth factors.
Intestines. Effect of antibiotics on motility of isolated sections, **1352**; effect of aureomycin on the pig's gut, **1701**; osmotic pressure in cattle, **3893**.
See also Acetylcholine; Bacteria, General; Cobalt; Emphysema; Immunology, Antibodies and Antigens; Neoplasms; Phosphatase; Radiations; Vitamins, vitamin B_{12}.
Oesophagus. See Corynebacterium Infection, swine; Neoplasms, sarcoma.
Ruminant digestion. Functional disturbance in cattle from damage to vagus nerve, **218**; structure of the

DIGESTIVE SYSTEM—Ruminant digestion [cont'd.]
ovine ruminal epithelium, **268**; vagal nerve supply of the bovine stomach, **269**; rumen content in young calves, **518**; amino-acid metabolism in ovine rumen, **527**; phosphorus absorption in sheep, **528**; succinate production in ovine rumen, **1001**; action of physostigmine on gastric motility in sheep, **1017**; effect of forage on pH values of ingesta in lambs, **1696**; histamine and tyramine in rumen ingesta of overfed sheep, **1697**; alcoholic fermentation in lambs on glucose diet, **1707**; carbohydrates in bovine abomasal contents, **1709**; bovine reticuloruminal motility in relation to bloat and traumatic reticulitis, **1741**; continuous gastric secretion in goats and sheep, **1800**; role of sodium, **2092**; vagal nerve supply and eructation mechanism, **2093**; central nervous control of gastric movement in sheep and goats, **2094**; effect of glycaemic level on rumen motility in sheep, **2364**; ruminal sulphur metabolism in sheep, **2423**; nitrate reduction in the artificial rumen in the presence of various substances, **3259**; development of rumen papillae in cattle on various diets, **3876**; digestion of nitrogenous compounds, **3886**.
See also Bloat; Digestive System, fauna and flora; Magnesium; Nutrition.
Stomach. Function in horses, **1799**.
See also Neoplasms.
DIMETHYLQUINOXALINE DIOXIDE. Conversion in vitro into 2-hydroxymethyl-3-methylquinoxaline 1:4 dioxide, active against Gram-negative bacteria, **3120**.
DI-N-BUTYL TIN DILAURATE. See Anthelmintics, for poultry.
DINITROCRESOL. See Poisoning, organic.
DIPETALONEMA. Stimuli affecting migration of microfilariae of D. blanci, **3861**.
DIPHENYL-PARA-PHENYLENE DIAMINE. Distribution stopped in the U.S.A., **2957**; effect of vitamin E, D.P.P.D. and fish liver oil on reproduction in turkeys, **2956**.
DIPLOCOCCUS. See Streptococcus.
DIPS AND DIPPING. Bacteria isolated from arsenical dips, **68**; transmission of diseases to sheep by dipping, **1576**; dip tester, **2465**.
DIROFILARIA. Intake of microfilariae of D. immitis by A. aegypti, **165**; canine filariasis in Ceylon, **3536**; stimuli affecting migration of microfilariae of D. aethiops, D. immitis and D. repens, **3861**.
DISEASES, GENERAL. Threat of exotic animal diseases in Australia, **939**; infections with mixed aetiology, **940**; metabolic disturbances and infection, **1186**; prevention and control, **1371**; plans for reporting incidence and mortality in U.S. livestock, **1372**; bibliography of diseases of wild mammals and birds, **1373**; pathologic growth and parasitic disease, **2049**; eradication of infectious diseases in a region in the Ukraine, **2376**; microbiological safety, **3735**; economic losses in the U.S.A., **3918**.
See also Books, diseases, general; Chinchillas; Conferences and Congresses; Fowls, diseases, general; Immunology, general; Man, Diseases of Animals Transmissible to and from; Reports, U.S.A.; Reports, Yugoslavia; Sheep, diseases, general; Swine, virus and rickettsial diseases; Turkeys; Viruses, General; Vitamins, vitamin A.
DISINFECTION AND DISINFECTANTS. Aerosols for disinfection of poultry houses, **1875**; **3304**; use of caustic soda in vet. practice, **3947**.
See also Bacillus Anthracis Infection; Eggs, Hen; Formaldehyde; Hygiene, livestock; Laryngotracheitis, Avian Infectious; Mastitis, Bovine; Mycobacterium Tuberculosis; Mycobacterium Tuberculosis Infection, general; Streptococcus Equi Infection; Trichomonas Infection, cattle; Trichophyton.
DISTEMPER, DOG. Histology of the c.n.s., **109**; treatment with spleen extracts, **110**; and concurrent toxoplasmosis, **436-437**; c.f. reaction, **460-462**; **3482**; study of virus in ferrets, **463**; living virus dust vaccine, **839**; response of young ferrets to egg-adapted strain, **840**; adaptation to mice, **841**; canine virus forum, **1265**; neutralizing antibodies, **1633**; adsorbate vaccine, **1634**; in army dogs, **1973**; interference phenomenon, **1974**; egg-adaptation of fox virus, **1976**; treatment of nervous form by prefrontal lobectomy, **2304**; as cause of jaundice and bilirubinaemia in ferrets and raccoons, **2305**; experiences, **2609**; encephalitis, **2610**; dual vaccination against distemper and virus hepatitis, **2612**; complement-fixing antibodies, **2894**; hard pad disease in Berlin, **2895**; fluorescent antibody studies of demyelination, **2896**; avianized virus vaccine, **2897**; prophylaxis in arctic sled dogs, **3165**; study by means of fluorescent antibody, **3806**; isolation from maned wolf, **3807**.
See also Encephalitis, General.
DISTEMPER, MINK. Inclusion bodies, **1266**; response of mink to nebulized virus, **1975**; mixed infection with toxoplasmosis, **2611**.
DOGS.
General. See Barking; Behaviour of Animals; Blood, composition; corpuscles (red); picture; transfusion; Genital System, prostate gland; Nervous System, general; cerebrospinal fluid; Parturition; Pregnancy, diagnosis; Respiratory System, general; Semen and Spermatozoa; Spleen; Vitamins, vitamin B_{12}; Weltmann Reaction.
Arthropod parasites. See Mange.
Bacterial and fungous diseases. See Actinobacillus; Bartonella; Brucella Tularensis Infection; Candida; Fungi, General; Histoplasma; Leptospira Infection; Microsporum; Nocardia; Pseudomonas; Salmonella Infection; Staphylococcus Infection.
Diseases, general. See Adrenal Gland, general; Anaesthesia and Analgesia; Bones; Circulatory System, heart; Diabetes Mellitus; Digestive System, diseases; Electric Shock; Eyes; Haemophilia; Heredity, of disease; lethal factors; Joints; Kidneys; Liver, diseases; Motion Sickness; Myositis, Eosinophilic; Neoplasms; Nervous System, cerebrospinal fluid, Pancreas; Penicillin; Poisoning, organic; plants; Spinal Column; Teeth; Urinary System, diseases; Vitamins, B_{12}.
Helminth parasites. See Ancylostoma; Anthelmintics; Capillaria; Dirofilaria; Echinococcus; Filaria; Helminth Parasites, General; Spirocerca; Trichinella.
Protozoan diseases. See Isospora Infection; Leishmania Infection; Pneumocystis; Toxoplasma Infection.
Virus and rickettsial diseases. See Aujeszky's Disease; Distemper; Encephalomyelitis, Canine; Hepatitis, Canine Virus; Horsesickness, African; Rabies; Rickettsia Infection.
DONKEYS. See Horses, Donkeys and Mules.
"DOPING." Of a race horse, **235**; pre-race test, **3041**.
DORNASE, PANCREATIC. See Rhinotracheitis, Infectious Bovine.
DOURINE. See Trypanosoma Infection, horses.
DUCK PLAGUE. In wild and domestic ducks in the Netherlands, **1278**.
DUCKS. See Aegyptianella; Clostridium Botulinum Intoxication; Duck Plague; Filaria; Haemoproteus; Hepatitis, Duck Virus; Hystrichis; Leucocytozoon Infection; Mycobacterium Tuberculosis Infection, general; tuberculin test; Neoplasms, carcinoma; Pfeifferella Anatipestifer Infection; Poisoning, inorganic; Salmonella Infection, avian; Salmonella Typhi-Murium; Vitamins, vitamin E.
DYSENTERY, VIBRIONIC. In swine caused by V. coli (V. suis), **52**; **2222**; in hoggets in New Zealand, **398**; caused by V. jejuni in cattle, **1563**; relationship with oedema disease in pigs, **1751**.
DYSTROPHY, MUSCULAR. See Muscles.

E

EARS. See Anaesthesia and Analgesia; Corynebacterium Infection, swine.
EARTHWORMS. See Parasiticides.
EAST COAST FEVER. See Theileria Infection.
ECHINOCOCCUS. Serum protein content in cattle with pulmonary infestation, **1678**; serum protein content in cattle with parasitic liver lesions, **1679**; hydatid cysts in a mare, **2012**; incidence in sheep, **3200**; eradication in sheep, **3201**; experimental infection in dogs, **3522**.
ECHINOPARYPHIUM. E. recurvatum associated with death in swans, **877**.
ECTHYMA, CONTAGIOUS. See Dermatitis, Contagious Pustular.
ECTROMELIA. See Pox Diseases, mouse pox.
ECZEMA. See Poisoning, plants; Skin, diseases.
EDUCATION. See Reports, New Zealand, United Kingdom, Yugoslavia.
EGGS, DUCK. See Mycobacterium Tuberculosis Infection, general; Salmonella Infection, general.
EGGS, HEN. Discoloration of yolk and gossypol, **899**; strength of shell, **999**; unabsorbed yolk in chicks, **1000**; green yolk produced by feeding sodium copper chlorophyllin, **1699**; pasteurization, **1808**; "shell pasteurization" to prevent rotting, **2130**; germicidal dips for hatching eggs, **2131**; effect of sulphonamides on shell formation, **2410**; restriction of ooporphyrin deposition on shells by drug feeding, **2463**; effect of feeding treated grains to hens, **2664**; **2706**; artificial light for control of seasonal variation in production, **2749**; identification of non-laying hens, **2750**; bacterial contamination and chlorination before incubation, **2823**; immunity of chicks from virus infected eggs, **2866**; effect of day-length on egg yield, **3643**; chlortetracycline concentration in eggs of hens fed supplements, **3881**.
See also Formaldehyde; Fowl Paralysis and Avian Leucosis Complex; Salmonella Infection, general; Salmonella Typhi-Murium.
EGYPT. See Chronic Respiratory Disease; Pasteurella Infection, general.
EIMERIA ARLOINGI. See Eimeria Infection, sheep and goats.

EIMERIA BOVIS. See Eimeria Infection, cattle.
EIMERIA BUKIDNONENSIS. See Eimeria Infection, cattle.
EIMERIA INFECTION.
General. Sporulation of oocysts, **73**; 25 years of research, **800**; drug resistance, **1591**; potentiation of coccidiostatics by pyrimethamine, **1927**; synergism in the chemotherapy of E. tenella infection, **2244**; treatment and histology, **2576**; i/v acriflavine for rabbits, **2850**; synergism between pyrimethamine and sulphadimethylpyrimidine against E. tenella, **2853**.
Avian. Coccidiosis in chicks, **429**; thyroidal activity and caecal coccidiosis, **801**; control and treatment with nitrofurazone, sulphadimidine, sulphaquinoxaline and nitrophenide, **802-804**; tolerance of sulphaquinoxaline, **805**; "nicarbazin" prophylaxis, **1589**; prevention and treatment in the Belgian Congo, **1590**; effect on blood cells, **2243**; absorption and excretion of oral nicarbazin, **2245**; studies **2851**; severity of infection in relation to host's age and number of ingested oocysts, **2852**; comparison of nitrophenide and sulphaquinoxaline, **2854**; nitrofurazone treatment and prophylaxis, **3133**; **3759**.
See also Nitrofurazone; Poisoning, therapeutic substances.
Cattle. E. bukidnonensis oocysts in a calf in Nigeria, **428**; sulphaquinoxaline treatment, **593**; **2847**; in calves in Bombay, **798**; ammonium salts for treatment and prevention, **2574**; sulphaquinoxaline and sulphamerazine in exp. E. bovis infection in calves, **2575**.
Sheep and goats. In Bombay, **799**; with E. arloingi in Yugoslavia, **2848**; treatment, **2849**.
EIMERIA TENELLA. See Eimeria Infection, general.
EJACULATION. See Semen and Spermatozoa.
ELECTRIC SHOCK. Effect of curarizing drug in dogs, **2096**.
See also Abattoirs and Slaughter.
ELECTROCARDIOGRAPHY. See Anaesthesia and Analgesia.
ELECTROLYTES. Water and electrolyte metabolism in goats, **1003**.
ELECTRON MICROSCOPY. An introduction, **1062**.
See also Bacteria, General; Circulatory System, heart; Leptospira Infection, general; Rabies; Spirochaeta Infection.
ELECTROPHORESIS. Book, **1086**; micro-electrophoretic examination of blood proteins in cattle in leucosis, brucellosis and TB., **1739**; use of stains in electrophoretic and immuno-electrophoretic analysis in agar gel, **3327**.
See also Blood, haemoglobin; Encephalomyelitis, Porcine; Foot and Mouth Disease, immunology; Mycobacterium Tuberculosis Infection, immunology; Nippostrongylus; Oedema Disease of Pigs; Rabies, general.
ELEPHANTS. See Embryos, Mammalian, and Foetuses.
EMBRYOS, FOWL. Effect of atmospheric pressure on development, **648**; calcium supply, **2087**; tolerance to low temperatures, **2414**; lethal effect of endotoxins on chick embryos, **3672**.
See also Ancylostoma; Chronic Respiratory Disease; Immunology, general; Influenza; Mycobacteria, General; Newcastle Disease, virus; Pleuro-Pneumonia, Caprine Contagious; Pneumonitis, Feline; Semen and Spermatozoa; Staphylococcus Infection; Stomatitis, Vesicular; Ticks, Ixodidae; Vitamins, vitamin B_{12}.
EMBRYOS, MAMMALIAN, AND FOETUSES. Inbreeding and embryonic loss, **287**; textbook, **328**; description of elephant foetus, **995**; potassium content of bovine amniotic and allantoic fluids, **997**; acetate uptake by foetal sheep, **1786**; prenatal ingestion of fluorides and transfer to foetus, **2070**.
See also Abortion, General; Blood, composition; Circulatory System, general; Clostridium Infection, sheep; Genital System, uterus; Liver, general; Poisoning, plants; Pregnancy; Sex; Vibrio Fetus Infection; Viruses, General.
EMETINE HYDROCHLORIDE. See Anthelmintics, for sheep and goats.
EMOTION. See Blood, composition.
EMPHYSEMA. Physiopathology and treatment, **1394**; intestinal, in pigs, **2990**.
ENCEPHALITIS, GENERAL. Histological differentiation of forms of porcine encephalitis, **2888**; causes of infectious equine encephalitides, **2982**; comparative pathology of eosinophilic porcine form and that of dog distemper, **3459**.
See also Distemper, Dog; Mycobacterium Tuberculosis; Rickettsia Infection, dogs; Vitamins, vitamin B_{12}.
ENCEPHALITIS, JAPANESE. Causing stillbirth in exp. infected sows, **2276**; serological response to type B vaccine in children and horses immune to St. Louis virus, **3780**.
ENCEPHALITIS, ST. LOUIS. Serological response to Japanese B. encephalitis vaccine in children and horses immune to St. Louis virus, **3780**.
ENCEPHALOMALACIA, AVIAN. Effect of tocopherol, antioxidants and fish oil on incidence, **2043-2044**; **3572**; incidence in England and Wales, **3227**; treatment and pathology, **3906**.
ENCEPHALOMALACIA, TOXIC. See Poisoning, plants.
ENCEPHALOMYELITIS, AVIAN (EPIDEMIC TREMOR). Outbreak in a flock, **1615**; vaccination, **1616**; infection with egg adapted strain, **3818**.
ENCEPHALOMYELITIS, BOVINE. Shizuoka virus as causative agent, **1965-1966**; in young buffaloes, possibly caused by a virus, **2600**.
ENCEPHALOMYELITIS, CANINE. Virus association, **2306**.
ENCEPHALOMYELITIS, EQUINE. Virus cultivation in fish embryos, **91**; in pheasants, **448**; susceptibility of pigeons, **1238**; hyperimmune serum concentrates, **1239**; contact insecticides for control of vectors, **1311**; a study, **1956**; time of survival of Eastern virus at 4° C., **1957**; role of Culex tarsalis in transmission of Western type, **2274-2275**; effect of certain chemicals on Eastern virus, **3152**; pathology of Venezuelan type, **3153**; Venezuelan type in birds and horses, **3460-3461**.
See also Acridines.
ENCEPHALOMYELITIS, MOUSE. Growth of virus in murine nervous tissue tumours, **447**.
ENCEPHALOMYELITIS, PORCINE (TESCHEN DISEASE). Review of the literature, **101**; paper electrophoresis of serum, **102**; c.f. test, **103**; neutralizing antibodies in hyperimmunized pigs, **104**; tissue culture, **454**; vaccine, **455**; lesions in the c.n.s. in acute and chronic infection, **835**; virus studies, **1256-1260**; immunization, **1261**; virus migration in the body, **1631**; neutralization of virus using hyperimmune gamma globulin, **2889**; vitamin D_2 prophylaxis, **2890**; adsorbate vaccine, **2891**; epidemiological data on F. and M. disease, Teschen disease and blackleg, **2981**.
ENDAMOEBA. Effect of oxysteroids on the inhibitory action of antibiotics on bacteria and E. histolytica, **2412**.
ENDOCARDITIS. See Circulatory System, heart.
ENDOCRINE SYSTEM. Book, comparative endocrinology, **2471**.
ENDRIN. See Poisoning, therapeutic substances; Vermin Control.
ENERGY OUTPUT. Study of horse traction, **3014**.
ENTERITIS, FELINE. Susceptibility of ferrets and mice, **1269**; in wild Felidae, **1636**; transmission to mink, **3485**.
ENTERITIS, GENERAL. See Digestive System.
ENTERITIS, MINK. Prevention by feline panleukopenia vaccine, **3486**.
See also Enteritis, Feline.
ENTERITIS, PORCINE. Role of V. coli (V. suis), **52**; aetiology, **53**.
See also Clostridium Infection, swine; Dysentery, Vibrionic.
ENTEROBACTERIACEAE. See Salmonella Group.
ENTEROHEPATITIS OF TURKEYS. See Histomonas Meleagridis Infection.
ENVIRONMENT. See Growth, general; Hygiene, livestock; Temperature.
ENZYMES, GENERAL. In therapy, **249**; normal values for porcine serum enzymes, **1004**; as anthelmintics for fowls, **1689**; acid and alkaline phosphatases, diastase and lipase in serum of ruminants, **1792-1793**.
See also Digestive System, general.
EPERYTHROZOON. In a pig, **2840**; ascites tumour during passage of E. coccoides in mice, **3219**.
EPIDEMIC COUGH. In Yugoslav army horses, **942-943**.
EPIDEMIC TREMOR. See Encephalomyelitis, Avian.
EPIDIDYMITIS. See Brucella Infection, sheep and goats.
EPIRENAMIN. See Adrenal Gland, medullary hormones (adrenalin).
ERGOT. See Claviceps; Poisoning, plants.
ERGOTAMINE. Effect on milk ejection in rats, **2425**.
ERGOTHIONEINE. See Claviceps.
ERUCTATION. See Digestive System, ruminant digestion.
ERYSIPELOTHRIX (LISTERIA) MONOCYTOGENES INFECTION. Biochemical and antigenic properties of strains, **355**; in pigs, **1133**; **2185**; **2785**; differentiation from bovine malignant catarrh, **1375**; in bovine mesenteric lymph nodes, **2184**; book, **2467**; enhancement of ovine infection, **2786**; use of antimetabolites in fowls, **2787**; epizootiology, **3090**; electron microscopy, **3091**; antigenic relationship with Staph. aureus, **3118**; isolation from calf liver, and intrauterine infection, **3369**; ovine "circling disease" in Shetland, **3370**; immunology and pathogenesis in sheep, **3371**; serological diagnosis, **3694**; meningitis by a rare type of listeria in German sheep, **3695**; causing abortion in goats, **3696**; in chinchillas, **3697**.
ERYSIPELOTHRIX RHUSIOPATHIAE INFECTION. Experimental studies, **20**; **716-724**; **2180-2182**; **3366**; bacterin for control in turkeys, **21**; enzymic purification of vaccine, **354**; as cause of porcine abortion, **725**; adsorbate vaccine, **726**; serum-culture method of immunization, **727**; immunization in Poland, **728**; resistance to heat and sodium chloride, **729**; life span in carcasses, **730**; causing arthritis in pigs, **1127**; vaccine, **1128**; hyperimmunization of horses with types A and B, **1129**; antibiotic feeding for prophy-

ERYSIPELOTHRIX RHUSIOPATHIAE INFECTION
—[cont'd.]
laxis, 1130; biochemical and culture properties, 1131; dissociation, 1132; 2504; immunobiology of Roumanian strains, 1516; treatment, 1517; immunization principles, 1864; in the Belgian Congo, 2179; effect of u-v. light on immunizing capacity of serum, 2183; transmission by houseflies, 2500; subclinical infection and epidemiology, 2501; bacterin, 2502; chick-embryo culture, 2503; action of erythromycin in pigeons, 2505; chemotherapy in chicks and turkeys, 2506; Oesophagostomum, swine erysipelas and swine fever, 2641; behaviour in the skin of pigs, 2780; action of cortisone, 2781-2782; a selective medium, 2783; improvement of avirulent vaccine, 2784; transmission by Stomoxys calcitrans, 3367-3368; arthritis in rabbits, response to cortisone, 3692; dihydrostreptomycin treatment in exp. infection in pigeons, 3693.
ERYTHROBLASTOSIS. Morphology of avian virus, 1281; and blood group inheritance in rabbits, 2000; experimental production in rabbits, 3833.
ERYTHROMYCIN. See Carbomycin.
ETHER. See Anaesthesia and Analgesia.
ETHIDIUM BROMIDE. See Trypanosoma Infection, cattle.
ETHIONINE. See Immunology, complement fixation.
ETHYL ALCOHOL. See Bacillus Anthracis Infection.
EXANTHEMA, VESICULAR. Report of U.S. advisory committee, 836; in pigs, 1632; 3162.
EXOSTOSES. See Bones, diseases.
EYES.
General. Intra-ocular pressure, 258; chemistry of Descemet's membrane of bovine cornea, 271; comparison of aqueous humour and c.s. fluid in rabbits, 996; a system of testing vision in animals, 3599.
Diseases. Progressive retinal atrophy in dogs, 1388; retinal dystrophy in rats, 2126; book, veterinary ophthalmology, 2763; keratoconjunctivitis in turkeys, 3934.
See also Borna Disease; Conjunctivitis, Bovine Infectious; Heredity, cattle; horses; Neoplasms; Newcastle Disease; Onchocerca; Ophthalmia, Equine Periodic; Ophthalmia, Ovine Contagious; Radiations; Thelazia; Vitamins, vitamin A.

F

FAECES. Sympatheticotonic substance in faecal extracts of cows, 1789; gametokinetic substance in cow faeces, 1790; coprophagy in rabbits, 2032.
See also Nutrition, general; Sex Hormones, androgens.
FARM BUILDINGS. See Hygiene, livestock.
FASCIOLA. In Australia, 149; F. hepatica associated with loss of blood in rabbits, 150; diagnosis, 876; serum protein levels in infested cattle, 1679; protein and polysaccharide antigens, 2008; treatment by s/c inj. of carbon tetrachloride, 2337; 2934; 2935; new egg-counting technique, 3196; hourly fluctuations in egg counts in bovine rectal contents, 3844; pathology of exp. infestation in rabbits, 3845.
See also Hygiene, food; Limnaea.
FAT. See Milk and Milk Products; Muscles; Neoplasms, general; Nutrition, general.
FAT NECROSIS. In cattle, 2988.
FATTY ACIDS. See Adrenal Gland, cortical hormones; Semen and Spermatozoa.
FAVUS. See Trichophyton.
FERMICIDIN. See Anaemia, Equine Infectious.
FERRETS. See Distemper, Dog; Nervous System, brain.
FERTILITY. And milk yield in cattle, 1452; effect of precoital stimulation in bulls on behaviour and conception rate, 1810; endocrine relationship in cockerels of low fertility, 1819; cattle fertility and sterility, 1845; effect of cold on onset of breeding season and fertility in sheep, 2112; fecundity and embryonic mortality in pigs, 3028; role of heredity and husbandry practices, 3316; factors influencing fertility, 3317-3318; effect of shearing and feeding on fertility in sheep, 3969.
See also Calcium; Irradiation; Nutrition; Poisoning, inorganic; Semen and Spermatozoa; Sex Hormones, progesterone; Sterility; Vitamins, vitamin B (pantothenic acid).
FERTILIZATION. See Genital System, general; Sex Hormones, oestrogens.
FERTILIZERS. See Copper.
FESCUE LAMENESS. See Poisoning, plants.
FIBROMA, SHOPE'S See Myxomatosis.
FIJI. See Reports.
FILARIAE. Blood parasites in wild and domestic ducks in Maine, 1300; in cattle in the Belgian Congo, 2644-2647; control in dogs, 3216; periodicity of microfilariae, 3861.
See also Dirofilaria; Setaria; Wuchereria.
FISHES. See Viruses, General.
FISH OIL. See Encephalomalacia, Avian.
FISTULA. See Digestive System, general.
FITS. See Nutrition, in relation to disease.
FLEECE. See Wool.
FLUORESCENCE MICROSCOPY. See Mycobacterium Tuberculosis Infection, diagnosis.
FLUOROSIS. See Poisoning, inorganic; Urinary System, diseases.
FLYING FOXES. See Hepatocystis.
FOALS. See Horses, Donkeys and Mules.
FOETUSES. See Embryos, Mammalian, and Foetuses.
FOOD AND AGRICULTURAL ORGANIZATION (FAO). See Foot and Mouth Disease, immunology; Hygiene, food; Reports, international.
FOOD INSPECTION AND HYGIENE. See Hygiene, food.
FOOD POISONING. See Clostridium Botulinum Intoxication; Hygiene, food; Salmonella Infection, general; Salmonella Typhi-Murium.
FOOD PRODUCTION. Veterinary medicine and human health, 614; development of animal products in Northern Nigeria, 1463.
See also Hygiene, food; Reports, international.
FOOT AND MOUTH DISEASE.
General. Muscular lesions in g. pigs, 442; atmospheric pressure and incidence, 1222; sequelae, 1223; international convention for prevention, 1600; histaminaemia in exp. infection, 1601; proposals for control in the Far East, 2255; treatment and prevention of mastitis following F. & M. disease, 2262; liver catalase activity in infected g. pigs, 2263; in Europe during 1955, 2587; effect of tissue therapy on lactation in recovered cows, 2589; epidemiological data on F. & M. disease, Teschen disease and blackleg, 2981; histology of lesions in young rats, 3146; report, Pirbright Research Institute, 3768.
Immunology. Examination of hyperimmune and convalescent serum, 440-441; electrophoresis of serum from immunized goats, 813; preparation of hyperimmune serum, 814; tissue-culture titration method, 1225; pathogenicity for baby mice of adsorbed vaccine, 1226; maternal transfer of antibodies, 1227; in Argentina, 1602; polyvalent vaccines, 1603; dried vaccine, 1604; micromethod in serological diagnosis, 1941; report to FAO Council on import of vaccinated animals, 2256; vaccine prepared from exp. infected unfed calves, 2257-2258; allergy and vaccination, 2261; antibodies in serum of healthy man exposed to infection, 2264; substitution of aluminium hydroxide by aluminium salts of organic acids, 2860; i/d administration of vaccine, 3147; globulin content of immune serum, 3148; c.f. antibodies in cattle serum, 3443; active immunization, 3447; non-specific c.f. system, and absorption of heterologous antibody from serum, 3770.
Virus. European types, 82; commercial suspensions, 83; pathogenicity for newborn animals, 812; control of yeast-contamination in cultures, 1224; growth in tissue culture, 1605; 2259-2260; agar gel diffusion typing, 1940; ultrafiltration, 1942; growth and cytopathogenicity, 1943; production of large amounts in cows, 1944; titration, 2588; cultivation on explanted tongue epithelium, 2857; preparation from vesicle fluid, 2858; biochemistry, 2859; adaptation of type O to adult mice, 3145; virus titration in cattle, 3444; typing, 3445; resistance of the virus on pasture, 3446; adaptation of type O to day-old chicks, 3769.
FOOT ROT. In pigs in New Zealand, 1570.
See also Fusiformis Infection.
FORAMEN OVALE. See Circulatory System, heart.
FOREIGN BODY SYNDROME, CATTLE. The Sulkowitch test, 219 and 949; in relation to reticulo-ruminal motility, 1741; blood picture, 1742; experimental study, 1743; skin temperatures in zones of referred pain, 1744; X-ray investigation, 1745; referred pain as diagnostic aid, 2382.
FORMALDEHYDE. Fumigation of eggs, 1058.
FORMALIN. See Furiformis Infection.
FOWL CHOLERA. See Pasteurella Infection, fowls.
FOWL PARALYSIS AND AVIAN LEUCOSIS COMPLEX. Tumour incidence in progeny of hens injected with lymphomatosis virus, 174; study of myeloblastic leucosis, 175-177; 2655; egg transmission, 514; 2951; studies, 1339; microglia lesions in neural and ocular lymphomatosis, 1340; lesion patterns in fowls with transplantable lymphoid tumours, 1694; plasma phosphatase activity in normal and lymphomatous fowls, 1695; hatchability of eggs from susceptible and resistant fowls, 2026-2027; resistance in relation to reproduction, 2028; neutralization of virus of visceral lymphomatosis, 2029; transmission, 2357; lymphomatosis pamphlet, 2358; transmission of visceral lymphomatosis by live Newcastle vaccines, 3170; response to graded doses of visceral lymphomatosis virus, 3223; differentiation between avian leucosis and fowl paralysis, 3871; flock incidence, 3872; virus-like inclusion bodies in spleen and bone marrow of healthy and leucaemic fowls, 3873.
FOWL PLAGUE. Elementary structure of virus, 117; "incomplete" forms of virus, 1272; course of infection as compared with Newcastle disease, 1273; propagation in embryonic human lung, 2309; c.f. and c.f. inhibition test with fowl plague, Newcastle disease and swine influenza viruses, 2321.
See also Newcastle Disease.

FOWL POX AND DIPHTHERIA. See Pox Diseases.
FOWLS.
General. See Anaesthesia and Analgesia; Desoxycorticosterone Acetate; Digestive System, general; fauna and flora; Furazolidone; Growth; Hygiene, livestock; Insemination, Artificial; Kidneys; Moulting; Nervous System, brain; Nutrition, general; Semen and Spermatozoa, general; diluents and additives; Sex Hormones, androgens; Temperature, environmental; Thymus; Vitamins, vitamin B_{12}; Zootechny.
Arthropod parasites. See Bdellonyssus Sylvarum; Dermanyssus; Megninia.
Bacterial and fungous diseases. See Aspergillus; Bacterium Coli; Candida; Clostridium Welchii; Coryza, Avian; Erysipelothrix (Listeria) Monocytogenes Infection; Leptospira Infection, general; Mycobacterium Tuberculosis Infection; Pasteurella Infection; Pleuro-Pneumonia Group; Salmonella Gallinarum Infection; Salmonella Infection, avian; Salmonella Pullorum Infection; Spirochaeta Infection; Staphylococcus Infection; Trichophyton.
Diseases, general. Poultry diseases in Schleswig-Holstein, **3244.**
See also Anaemia, General; Blood, general; Bones; "Bumblefoot"; Cholesterol; Circulatory System, vessels; Cloaca; Encephalomalacia, Avian; Fertility; Fowl Paralysis and Avian Leucosis Complex; Haemorrhagic Syndrome, Fowls; Heredity; Liver, diseases; Navel; Nutrition, in relation to disease; Perosis; Pharmacology and Materia Medica, General; Poisoning; Pullet Disease; Radiations; Rape; Reports, U.S.A.; Round Heart Disease; Services, Veterinary; Tendons; Vitamins, vitamin E; Xanthomatosis.
Helminth parasites. See Acuaria; Anthelmintics; Ascaridia; Syngamus; Tetrameres.
Protozoan diseases. See Eimeria Infection; Histomonas Meleagridis Infection; Poisoning, therapeutic substances; Toxoplasma Infection.
Virus and rickettsial diseases. See Bronchitis, Avian; Chronic Respiratory Disease; Encephalomyelitis, Avian; Fowl Paralysis and Avian Leucosis Complex; Fowl Plague; Laryngotracheitis, Avian Infectious; Neoplasms; Newcastle Disease; Pox Diseases; Tendovaginitis-Arthritis Syndrome of Fowls.
FOWL TYPHOID. See Salmonella Gallinarum Infection.
FOXES. See Distemper, Dog.
FRACTURES. See Bones, general.
FRANCE. See Anaplasma Infection; Brucella Infection, swine; Leptospira Infection, horses; Myxomatosis; Rhinitis, Porcine Atrophic; Vibrio Fetus Infection.
FREEZE-DRYING. Using calcium carbide, **311**; for maintenance of cultures, **1059**; for preservation of small animals and plant specimens, **3040.**
See also Vibrios, General.
FRENCH EQUATORIAL AFRICA. See Oesophagostomum.
FRENCH GUIANA. See Salmonella Group.
FRENCH WEST AFRICA. See Rabies, general; Research Institutes.
FROGS AND TOADS. Book, development of Xenopus laevis, **4010.**
See also Pregnancy, diagnosis.
FRUCTOSE. See Blood, composition; Semen and Spermatozoa, general; Sugars.
FUNGI, GENERAL. A stain, **405**; Aspergillus fumigatus, Absidia ramosa, Mortierella polycephala and Mucor isolated in bovine abortion, **1189**; fungous spores resembling microfilariae in blood films, **1332**; poisoning by moulds, **1768**; mycotic mastitis in cattle, **2227**; use of antibiotics for the isolation of pathogenic fungi, **2550**; systemic fungous infections in dogs, **3416**; animal mycoses in Britain, **3736**; book, fungal poisoning, **3938.**
See also Books, mycology, and under generic names of fungi.
FUNGICIDES. Effect of seed dressing on laying hens, **238**; toxicity test of n-trichlormethylthio-tetrahydrophthalimide, **907**; action of nystatin (fungicidin), **1191**; antimycotics, **1202**; N-butyl-3-phenyl salicylamide, **3125.**
See also Histoplasma Capsulatum.
FURACILLIN. See Trypanosoma Infection, general.
FURAZOLIDONE. Effect on gonadal growth in cockerels, **797.**
See also Hexamita Infection; Histomonas Meleagridis Infection; Salmonella Gallinarum Infection; Salmonella Infection, avian; Salmonella Pullorum Infection.
FUSIFORMIS INFECTION. F. necrophorus infection in cattle, **54**; control of foot rot in sheep by formalin, **55**; cytology and life history, **399**; effect of management and feeding on foot rot in sheep, **773**; control of foot rot in sheep, **1564**; **1902**; aetiology of N. necrophorus foot rot in sheep, **1901**; F. necrophorus as cause of necrotic nodular hepatitis in lambs, **2223**; chloramphenicol treatment of bovine diphtheroid stomatitis in Kenya, **3732.**

G

GALLI-MAININI TEST. See Pregnancy, diagnosis.
GALLIUM. See Growth, growth factors.
GAMBIA. See Reports; Setaria.
GAMMA RAYS. See Radiations.
GAPEWORMS. See Syngamus.
GASTRO-ENTERITIS, PARASITIC. Control in goats, **882**; in cattle, **3524.**
GASTRO-ENTERITIS, PORCINE TRANSMISSIBLE. Some characteristics, **837**; "Oldenburg pig disease" in Germany, **2606**; airborne transmission, **2893**; in Poland, **3928.**
See also Enteritis, Porcine.
GASTROPHILUS. See Oestridae.
GEESE. See Mycobacterium Tuberculosis Infection, tuberculin test; Newcastle Disease; Nutrition, in relation to disease; Salmonella Infection, avian.
GENISTEIN. See Sex Hormones, oestrogens.
GENITAL SYSTEM.
General. Number of spermatozoa in relation to fertilization, **282**; mechanism of fertilization, **286**; effect of population size on weight of reproductive organs in mice, **309**; effect of nutrition on oestrus and conception in cows, **519**; effect of nutrition on reproduction in gilts, **1342-1343**; peritoneoscopy in cows, **2430**; reproductive tract abnormalities in sows, **3029**; fertilization studies in rabbits, **3030**; book, anatomy of genitals and reproduction in mammals, **3337**; bact. flora of the genital tract in ewes undergoing caesarian section, **3426.**
See also Bacterium Coli; Cloaca; Nymphomania; Sex Hormones; Sterility, cattle; Streptococcus Infection, cattle; horses.
Epididymis. Spermatozoal invasion, **2115**; function in the bull, **3967.**
See also Brucella Infection, sheep and goats; Sex Hormones, androgens; Trichomonas Infection, cattle.
Oestrous cycle. Anoestrus in cattle and nutrition, **179**; effect of presence of ram, **284**; effect of nutrition in heifers, **519**; postoestrous haemorrhage, **1030**; in zebu, **1031**; effect of reserpine in rats, **1032**; local treatment of uterus at different phases of sexual cycle, **1441**; disturbance in cows and cystic ovaries, **2119**; hormone control, **2122**; histochemistry of the bovine endometrium at various stages of the cycle, **2739**; effect on mare of presence of stallion, **2746**; glycogen content in vagina of mice, **3290**; elevation of platelets in mid-cycle, **3970.**
See also Insemination, Artificial; Semen and Spermatozoa; Sex Hormones, gonadotrophins; Sex Hormones, oestrogens; progesterone.
Ovaries, ova and ovulation. Morphology and cytochemistry, **291**; pathology of the fallopian tubes and ovarian bursae in cows, **635**; transfer of ova in sheep, **1029**; secretory process in the ovine oviduct, **1419**; transfer of ova between species, **1437**; aerobic flora of inflamed oviduct in fowls, **2238**; effect of hysterectomy on activity, **2452**; ovaries of the mare, **2738**; hormonal requirements of implantation in rabbits, **3031**; effect of temp. on survival of transplanted rabbit ova, **3320**; effect of alfalfa on ovarian development in alpha oestradiol treated rats, **3571.**
See also Eggs, Hen; Genital System, oestrous cycle; Insemination, Artificial; Nymphomania; Pullet Disease; Semen and Spermatozoa, general; Sex Hormones, gonadotrophins; oestrogens; progesterone.
Placenta. Plaque-like lesions in cattle, **299**; transport of oxygen in sheep, **605.**
See also Calcium; Embryos, Mammalian, and Foetuses; Haemolytic Diseases; Sex Hormones, gonadotrophins; Sugar; Toxoplasma Infection; Zinc.
Prostate gland. In dogs, **3638**; effect of oestrone and testosterone in adult dogs, **3639.**
Semen and spermatozoa. See Semen and Spermatozoa.
Seminal vesicles. Histochemical study in sheep, **1420.**
Testicles. Biopsy. **1453-1454**; **3977-3979**; calcification in bulls, **2742**; seasonal histological changes in buffaloes, **3292**; testicular atrophy in mice following exp. return of testicles to abdominal cavity, **3319.**
See also Brucella Infection, swine; Furazolidone; Zinc.
Uterus. Photography of the cervix in large animals, **298**; drug administration in metritis, **301**; dangerous side-effects of antibiotics in bovine metritis, **302**; treatment of metritis in cows and sows, **303**; treatment of diseases in cows, **1039**; treatment of metritis in cows by intra-uterine administration of oestrogens, **1442**; movement of radio-opaque material in the cow's uterus, **2118**; effect of hysterectomy on ovarian activity, **2452**; prolapse in cattle, **2453**; role of non-specific hyaluronidase inhibitor in serum on uterine motility, **3018**; development of caruncles in the bovine foetus, **3277.**
See also Anaesthesia and Analgesia; Genital System, oestrous cycle; Immunology, antibodies and antigens; Neoplasms; Pregnancy, general; Semen and Spermatozoa; Sex Hormones, oestrogens.

GENITAL SYSTEM—[cont'd.]
Vagina. Abnormalities in ewes, **1410**; prolapse in cattle, **2453**; pelvic anatomy in sheep with prolapse, **2740**.
See also Genital System, oestrous cycle; Immunology, antibodies and antigens; Neoplasms; Pregnancy, General; Sex Hormones, oestrogens; Vaginitis, Catarrhal.
GERMANY. See Babesia Infection, sheep; Brucella Infection; Brucella Melitensis Infection; Distemper, Dog; Erysipelothrix (Listeria) Monocytogenes Infection; Fowls, diseases, general; Gastro-Enteritis, Porcine Transmissible; Haemoglobinuria, Puerperal; Hyperkeratosis; Leptospira Infection, general; Mycobacterium Tuberculosis Infection; Pica; Psittacosis; Rabies, general; Salmonella Infection, general; Theileria Infection, sheep; Toxoplasma Infection; Vibrio Fetus Infection.
GIARDIA. In cattle in Italy, **3431**.
GIGANTOCOTYLE. G. explanatum (Paramphistomidae), in the liver of buffaloes in Ceylon, **2635**.
GIRAFFES. See Circulatory System, general.
GLÄSSER'S DISEASE. See Haemophilus Suis.
GLANDERS. See Pfeifferella Mallei Infection.
GLIOMA. See Neoplasms.
GLOMERULONEPHRITIS. See Kidneys.
GLOSSINA. Extermination of G. morsitans in N. Rhodesia, **872**; G. morsitans ugandensis in the Sudan, **1310**; report, East Africa Commission, **1582**; hosts of G. morsitans, **1669**; precipitin test of blood ingested by G. morsitans, **1670**; control in Tanganyika, **1671**; Colonial Office report, **1924**; book, natural history of tsetse flies, **2759**.
See also Trypanosoma Infection, general.
GLUCAGON. A pancreatic polypeptide, **3885**.
GLUCOSE. Tolerance in swine, **2365**.
See also Blood, composition; Digestive System, ruminant digestion; Hypoglycaemia; Immunology, complement fixation; Nervous System, brain; Pregnancy Toxaemia; Sugars.
GLYCEROL. Acute haemolytic crisis following s/c inj., **2993**.
See also Pregnancy Toxaemia; Trichomonas Infection, general.
GLYCERYL TRILAURATE. Effect on reproduction and lactation in rats, **2661**.
GLYCINE. See Immunology, complement fixation.
GLYCOGEN. See Genital System, oestrous cycle; Liver.
GOATS.
General. See Blood, composition; groups; picture; Circulatory System, vessels; Digestive System, ruminant digestion; Mammary Gland; Semen and Spermatozoa, general; Sex Hormones, gonadotrophins; Water.
Arthropod parasites. See Blowflies and Fleshflies; Mange.
Bacterial and fungous diseases. See Agalactia, Contagious, of Sheep and goats; Brucella Infection; Brucella Melitensis Infection; Corynebacterium Infection; Erysipelothrix (Listeria) Monocytogenes Infection; Staphylococcus Infection.
Diseases, general. See Adrenal Gland, general; Sweating Sickness.
Helminth parasites. See Anthelmintics; Haemonchus; Setaria; Trichostrongylus.
Protozoan diseases. See Anaplasma Infection; Eimeria Infection.
Virus and rickettsial diseases. See Dermatitis, Contagious Pustular; Foot and Mouth Disease, immunology; Pleuro-Pneumonia, Caprine Contagious; Pleuro-Pneumonia Group; Pneumonia, Caprine Virus; Rinderpest.
GOITRE. See Thyroid Gland.
GOLD COAST. See Blood, picture; Reports; Research Institutes.
GONADOTROPHINS. See Sex Hormones.
GONDERIA. See Theileria Infection.
GOSSYPOL. See Nutrition, general.
GRANULOMA. See Neoplasms.
GRASS SICKNESS. A study, **516**.
GRASS TETANY. See Magnesium.
GREECE. See Agalactia, Contagious of Sheep and Goats.
GREENLAND. See Trichinella.
GRENADA. See Reports.
GROWTH.
General. Effect of yolk removal on early growth of chick, **181**; quantitative determination, **906**; effect of NaCl and protein in rats, **916**; skin follicle development and growth rate in sheep, **1408**; effect of heredity and environment on weight in sheep, **1409**; effect of phosphorus, vitamin E and environment on growth and perosis in turkeys, **1721**; effect of amniotic fluid on cortisone growth inhibition in chicks, **1785**; survival and growth of lambs from ewes with defective udders, **1824**; lime treatment of maize as cause of growth depression in rats, **2683**; pathological effects of anterior pituitary growth hormone on swine, **2956**; Brahman cattle growth superior to that of other breeds in North Queensland, **3324**.
See also Blood, composition; Pastures and Grazing; Ultrasonic Waves.
Growth factors. Aureomycin hydrochloride for foals, **185**; inactivated penicillin for pigs, **186**; intestinal microorganisms, chlortetracycline and growth, **187**; response in poultry to antibiotics and arsonic acid, **188**; quaternary ammonium compounds for chicks, **189**; methionine supplements for turkeys, **193**; effect of whey on chicks, **526**; effect of dietary oxytetracycline on calves, **1346**; effectiveness of antibiotics in rats given vitamin B, **1347**; antibiotics for fowls, **1348**; **1349**; **2714**; penicillin supplements for chicks, **1350**; "tromalyt" a plant antibiotic food supplement for chicks, **1351**; thyroxine, stilboestrol and antibiotics for castrated pigs, **1353**; growth stimulants for cattle, **1700**; effect of environment and antibiotics in pigs, **1702**; effect of aureomycin on metabolism in pigs, **1703**; antibiotics and copper supplements for pigs, **1705**; high copper mineral mixture for pigs, **1706**; histological reaction in baby pigs to synthetic milk plus sucrose, **1708**; diethylstilboestrol for cattle and lambs, **1822-1823**; effect on progeny of oral administration of chlortetracycline and penicillin to g. pigs, **2034**; effect of water intake on response of poults and chicks to penicillin, **2035**; sodium sulphate for chicks, **2036**; s/c implantation of antibiotics for lambs and calves, **2127**; experiences with antibiotics, **2362**; growth in germ-free birds fed antibiotics, **2363**; effect of thyroprotein on baby chicks, **2373**; response in chicks to antibiotics and increase in intestinal coliforms, **2665**; effect of titanium and gallium in fowls, **2678**; antibiotics for pigs, **3228-3231**; aureomycin for calves, **3548**; bromine for chicks, **3549**.
See also Books, nutrition; Digestive System, fauna and flora; intestines; Eggs, Hen; Manganese; Thyroid Gland.
GUANAZOLO. See Choriomeningitis, Lymphocytic Murine.
GUINEA PIGS. See Behaviour of Animals; Blood, picture; Ringworm; Salmonella Infection, general; Streptococcus Infection, general.

H

"HAEMAGGLUTINATING VIRUS OF JAPAN." Isolated from pigs with nervous symptoms, **2300-2302**.
HAEMANGIOPERICYTOMA. See Neoplasms.
HAEMATURIA, BOVINE CHRONIC. In Turkey, **217**; role of saponins, **554**; a prothrombin deficiency?, **946**; Corynebact. renale as suspected cause in India, **2054**; lesions, **2381**; parasitological examination of infected cattle in Turkey, **2627**; aetiology and pathogenesis, **3921-3923**.
See also Poisoning, plants.
HAEMOGLOBINURIA, GENERAL. See Clostridium Infection, cattle.
HAEMOGLOBINURIA, PUERPERAL. In cows in Germany, **1714**; post-parturient haemoglobinuria (haemoglobinaemia) in cattle, **2986**.
HAEMOLYSIN. See Semen and Spermatozoa, general.
HAEMOLYTIC DISEASES. In newborn foals, **144**; in newborn piglets, **1299**; **2980**; **3512**; experimental transmission in mule foals by the placental route, **1999**; Coombs test of anti-A and anti-B produced by immunization with various group A and B substances and by heterospecific pregnancy, **3832**.
HAEMONCHUS. Intradermo-palpebral test for sheep and goats, **158**; susceptibility of cattle, **500**; effect of host diet on larvae, **501**; "self-cure" in sheep, **2013**; in relation to cobalt deficiency in lambs, **2933**; effect of trace elements, dicalcium phosphate and phenothiazine on resistance of lambs to H. contortus, **3207**.
See also Phenothiazine.
HAEMOPHILIA. Haemophilic arthropathy in dogs, **306**; coagulation mechanism and "haemophilioid" condition in horses, **551-552**; diagnosis and treatment, **1457**.
HAEMOPHILUS SUIS. Differentiation of strains, **360**; aetiology of Glässer's disease, **733**.
HAEMOPROTEUS. Blood parasites in wild and domestic ducks in Maine, **1300**.
HAEMORRHAGIC SEPTICAEMIA. See Pasteurella Infection, cattle.
HAEMORRHAGIC SYNDROME, FOWLS. Menadione sodium bisulphate treatment, **539-540**; mycotoxic studies, **580**; studies, **1754**; **2994**; pathology, **3593**; clinical study, **3594**.
HAIR. Copper content, **994**; arsenious oxide content in cattle, **1760**; demonstration of radioactive sulphur in rabbit hair, **3278**.
See also Heredity, general; Skin, general; Trichophyton.
HAMSTERS. See Poisoning, therapeutic substances; Salmonella Infection, general.
HAPLOSPORANGIUM. Haplomycosis in mice in Sweden, **3123**.
HARD PAD DISEASE. See Distemper, Dog.
HARES. See Brucella Infection, general; Myxomatosis; Salmonella Infection, general; Toxoplasma Infection.

HEART. See Circulatory System.
HEAT REGULATION. See Temperature.
HEINZ BODIES. See Anaemia, Equine Infectious.
HELENINE. See Poliomyelitis.
HELIOTROPIUM. See Poisoning, plants.
HELMINTH PARASITES, GENERAL. In dogs, **496**; nematode burden of sheep on lowland farms, **880**; development of helminthology in the Soviet Union, **894**; fungous spores resembling microfilariae in blood films, **1332**; in ducks in England, **1333**; in C.S.I.R.O. report, Australia, **1472**; intestinal parasites in donkeys and eosinophilia, **2639**; survival on pasture of gastro-intestinal parasites of cattle, **2640**; report on meeting of Soviet helminthologists, **2950**; morphology, **3198**; Russian scheme for total eradication of helminths, **3537-3538**; P.M. recovery of nematodes from ruminants, **3857**.
See also Anthelmintics; Haematuria, Bovine Chronic; Nematodiasis, Cerebrospinal; Technique, parasitological.
"HEMOSPORIDIN." See Babesia Infection, cattle; horses; sheep.
HEPATITIS, CANINE VIRUS. Incidence, course and diagnosis, **111**; c.f. reaction in distemper complex and Rubarth's disease, **462**; canine virus forum, **1265**; use of mice for diagnosis, **1267**; tissue culture, **1268**; **3483**; serological diagnosis, **1635**; clinical aspects, **1977**; dual vaccination against distemper and hepatitis, **2612**; properties of antigen, **2613**; transmissibility to man, **2614**; a study, **3166**; effect on tissue culture cells, **3167**; virus evaluation by intra-ocular inj. of serum-virus mixture, **3484**; as cause of encephalitis in dogs, **3808**; in baboon, **3809**; inapparent infection in man, **3810**.
HEPATITIS, DUCK VIRUS. Pathology, **1286**; in ducklings, **1984**; production of resistant ducklings, **3502**.
HEPATITIS, GENERAL. See Clostridium Infection, cattle; Liver, diseases.
HEPATITIS, MOUSE VIRUS. Pathogenicity of virus, **114**; infection of weanling mice, **115**; virus characteristics, **1270**.
HEPATOCYSTIS. In Australian flying foxes, **1938**.
HEREDITY.
General. Book, lethal factors and hereditary pathology, **3054**.
See also Fertility; Growth, general; Porphyria; Radiations; Teratology; Trichostrongylus.
Cattle. Heredity of disease and lethal factors, **1045**; oedema, **1046**; inherited corneal opacity, **1047-1048**; the chromosomes of infertile bulls, **2449**; hereditary "tongue-wagging," **2700**; spastic lameness in Friesian calves, **3246-3247**; inherited developmental defects in cattle, **3641**; radiographic demonstration of dwarf-gene beef cattle, **3987**.
See also Mammary Gland.
Dogs and Cats. Inherited defects in dogs, **305**; feline cerebellar ataxia, **1458**; lethal factors in dogs and cats, **2456**.
See also Haemophilia.
Fowls. Hereditary crippling in fowls, **307**; congenital crooked toes in fowls, **3322**.
See also Pullet Disease.
Horses. Hereditary absence of the iris, **1456**.
See also Haemophilia.
Sheep. Lethal factors, **1042**; dominant N gene in New Zealand Romney sheep, **1055**; inheritance of birthcoats in Merinos, **1056**; inheritance of halo-hair in New Zealand Romney sheep, **1057**; inheritance of hornlessness, **2459**.
See also Growth, general.
HERNIA, INGUINAL. In sheep, **2059**.
HETRAZAN. See Anthelmintics, for cattle.
HEXACHLOROETHANE. See Oestridae, Hypoderma.
HEXACHLORONAPHTHALENE. See Poisoning, therapeutic substances.
HEXACHLOROPHENE. See Anthelmintics, for poultry.
HEXAMITA INFECTION. Furazolidone treatment in poults, **796**.
HIBERNATION. See Aujeszky's Disease; Magnesium.
"HIBITANE." See Trichomonas Infection, cattle.
HIDES AND SKINS. Animal products in Northern Nigeria, **1463**; depilation of sheep skins with acetic acid, **3985**.
See also Myxomatosis; Oestridae, Hypoderma.
HIRSCHSPRUNG'S DISEASE. See Digestive System, diseases.
HISTAMINE. Histamine death in swine, **142**.
See also Digestive System, ruminant digestion; Foot and Mouth Disease, general; Liver, bile; Mycobacterium Tuberculosis Infection, tuberculin test; Potassium.
HISTOMONAS MELEAGRIDIS INFECTION. Histopathology in turkeys—role of C. albicans, **1215**; size of infective dose and course, in turkeys, **1925**; furazolidone in control, **1926**; **3758**; blood-induced infection, **2573**; and moniliasis in capercaillie, **2824**; infection of chicks, **3429**; survival in faeces of infected birds, **3430**.
HISTOPLASMA CAPSULATUM. Inapparent infection in dogs, cats and other animals, **58**; immunization of mice, **59**; resistance of infected mice to Rickettsia typhi, **139**; effect of nystatin, **2228**; in Venezuela, **2553**; morphological variations in the agents of blastomycosis and histoplasmosis, **2554**; pathogenesis in dogs, **3415**.
HISTOPLASMA FARCIMINOSUM INFECTION. Diagnosis of epizootic lymphangitis by the histoplasmin test, **1192**; equine cryptococcosis, **2229**.
HOG CHOLERA. See Swine Fever.
HOLE'S TEST. See Mycobacterium Johnei Infection.
HOLLAND. See Netherlands.
HONDURAS. See Mouth.
HOOKWORMS. See Anthelmintics, for dogs.
HOOVES. See Zootechny.
HORNFLIES. See Siphona.
HORNS. See Anaesthesia and Analgesia; Heredity, sheep; Microsporum.
HORSES, DONKEYS AND MULES.
General. See Acetylcholine; Blood; Caesarian Section; Circulatory System, vessels; Digestive System, stomach; "Doping"; Genital System, oestrous cycle; ovaries; Growth, growth factors; Mammary Gland; Poisoning, general; Pregnancy, diagnosis; Radiations; Sex Hormones, gonadotrophins; steroids; Urinary System, general.
Arthropod parasites. See Oestridae, Gastrophilus; Oestrus.
Bacterial and fungous diseases. See Bacterium Viscosum Equi; Bacteroides; Clostridium Botulinum Intoxication; Clostridium Tetani Infection; Corynebacterium Infection; Histoplasma Farciminosum Infection; Leptospira Infection; Pfeifferella Mallei Infection; Pleuro-Pneumonia Group; Salmonella Abortus-Equi Infection; Streptococcus Equi Infection.
Diseases, general. Lesions resembling "summer sores" in horses, associated with ammonia content of air, **2985**.
See also Adrenal Gland, general; Anaesthesia and Analgesia; Casein, Iodinated; Colic; Encephalitis, General; Eyes; Grass Sickness; Haemolytic Diseases; Haemophilia; Heredity; Lameness; Mouth; Neoplasms, melanoma; Nymphomania; Ophthalmia, Equine Periodic; Phenothiazine; Pineal Gland; Poisoning, plants; Radiations; Respiratory System, diseases; Skin, diseases; Sterility; Ultrasonic Waves; Vitamins, vitamin B_{12}.
Helminth parasites. See Anthelmintics; Echinococcus; Helminth Parasites, General; Onchocerca; Phenothiazine; Setaria.
Protozoan diseases. See Babesia Infection; Nuttalia Infection; Sarcosporidia; Trypanosoma Infection.
Virus and rickettsial diseases. See Abortion, Equine Virus; Anaemia, Equine Infectious; Borna Disease; Encephalitis, Japanese; Encephalomyelitis, Equine; Epidemic Cough; Horsesickness, African; Influenza.
HORSESICKNESS, AFRICAN. Antibodies in dog serum, **1962**.
HOUSEFLIES. Transmitting mites and lice, **1676**.
See also Erysipelothrix Rhusiopathiae Infection; Hygiene, livestock; Parasiticides, general.
HOUSING OF LIVESTOCK. See Hygiene, livestock.
HUMP. Of East African cattle, **2099**.
HUNGARY. See Babesia Infection, horses; Leptospira Infection, general; cattle.
HYALOMMA. See Ticks, Ixodidae.
HYALURONIDASE. Addition to local anaesthetics, **1406**.
See also Genital System, uterus; Strongylus.
HYDATID DISEASE. See Echinococcus.
HYGIENE.
General. Veterinary medicine and human health, **614**.
Food. Precipitation test for detection of horse meat, **610-611**; ultra-violet light in meat inspection, **612**; meat from arsenic-poisoned animals for human consumption, **613**; pH of pork, **1424**; bacteriology of preserved meats, **1426**; serological methods in meat inspection, **1804**; factors influencing P.M. changes, **1805**; differential diagnosis of icterus and adipoxanthosis in meat inspection, **1807**; radioactive contamination, **2102**; penicillin content of carcass and meat inspection, **2433**; bacteriology of meat from animals with leucosis and fascioliasis, **2730**; use of antibiotics for meat and fish preservation, **2732**; fate of labelled insecticide residues in food products, **3297**; demonstration of anaerobes in meat, **3632**; nitrate poisoning from meat, **3633**; FAO/WHO Committee on Meat Hygiene, **3634**; bone taint in beef, **3959**.
See also Abattoirs and Slaughter; Books, meat inspection; Eggs, Hen; Milk and Milk Products; Muscles; Radiations; Salmonella Infection, general; Salmonella Typhi-Murium; Sarcosporidia; Sex Hormones, oestrogens; Staphylococcus Infection; Trichinella.
Livestock. Poultry housing, **617**; bovine environmental physiology and shelter engineering, **1014-1016**; **1412**; **3272-3274**; effect of housing on health and performance in

HYGIENE—Livestock—[cont'd.]
poultry, 1022; environment, health and productivity in pigs, 1464; heat production in pigs in relation to age and sty ventilation, 1704; environment comparisons and cattle gains in wood and wire corrals, 1809; aerosols for poultry houses, 1875; ventilation of piggeries, 2129; disinfection of pigsties and poultry houses with chlorine, 2462; control of flies in dairy barns, 2630; 3188; 3838; rearing calves in unheated byres in the U.S.S.R., 3037; circular farrowing pen for pigs, 3302; optimum population density of fowls, 3645; animal housing in relation to human health, 3981; international sanitary regulations in livestock trade, 3962; air temperature and humidity in piggeries, 3989.
See also Built-Up Litter; Mycobacterium Tuberculosis Infection, general; Pastures and Grazing; Siphona; Stomoxys.
HYMENOLEPIS. See Anthelmintics, for poultry.
HYPERKERATOSIS. Production in calves, 236; in cattle in Belgium, 974; cause in German cattle, 1769; observation on collagen, vitamin A, and ascorbic acid, 3603; caused by chlorinated naphthalene, 3604-3609.
See also Poisoning, organic; Stomatitis, General.
HYPOCALCAEMIA. See Calcium.
HYPODERMA. See Oestridae.
HYPOGLYCAEMIA. Blood inorganic phosphorus and serum potassium in ovine hypoglycaemia, 932; reversal in fasted pregnant ewes, 933; sodium ethyl oxalacetate treatment, 937; effect of i/v cobalt and methionine, 1733.
See also Blood, composition.
HYPOMAGNESAEMIA. See Magnesium.
HYPOTHALAMUS. See Nervous System, brain.
HYSTRICHIS. H. tricolor in ducks, 883.

I

ICTERUS. See Jaundice.
IMMUNOLOGY. See also under names of specific diseases.
General. Immunological effects of chick embryo parabiosis, 138; induced tolerance to heterologous blood in chick embryos, 140; estimation of albumin, alpha, beta and gamma globulin in serum, 864; properdin system and immunity, 1293; studies on the Shwartzman reaction, 1294-1295; effect of neurotomy on the Arthus-Sacharow phenomenon, 1296; effect of neurotomy on the Shwartzman phenomenon, 1297; the immune-adherence phenomenon, 1662; action of antibiotics, 1997; serum turbidity test for cattle diseases, 2053; bactericidal activity of serum and complement, 2330; bactericidal action of mouse serum, 2331; immunity of chicks from virus infected eggs, 2866; immunological tolerance, 2991; qualitative differences in immune response, 3183; properdin levels in mice after administration of bact. lipopolysaccharides, 3185; active immunity in young calves, 3510; isolation of live organisms from hyper-immune sera, 3511; induced changes in non-specific immunity, 3822.
Agglutination and Haemagglutination. See Streptococci, General.
See also under names of specific diseases.
Allergy and anaphylaxis. Allergic neuritis in rabbits, 141; phenylbutazone in allergic phenomena, 865; sensitization of g. pigs by horse serum, 1664; allergic lesions, 3186; pulmonary vascular changes in mice during shock, 3513.
See also Skin, diseases; and under names of specific diseases.
Antibodies and Antigens. Antibody production, 484-486; antibody formation in the omentum, 487; X-rays and secondary antibody response, 488; antibody response to diphtheria toxoid in vitamin deficiency, 489; inhibition of production in rabbits, 1292; use of Schultz-Dale test for detection of carcinoma antigens, 1335; mechanism of antibody-antigen reaction, 1995; local antibody production in mammary gland, spleen, uterus, vagina and appendix of the rabbit, 1996; antigen J in cattle and production of anti-J by isoimmunization, 2332; antibody synthesis during responses of rabbits to bovine gamma globulin, 2625; antibody and gamma globulin formation in vitro, 2915; inhibition of immunological enhancement by endotoxin in refractory rabbits, 2916; factors influencing effect of cortisone on antibody production, 3509; 3828; separation by centrifugation of two related antibodies, 3508; acquired tolerance to heterologous antigen, 3823; antigenic stimulus in transplantation immunity, 3824; leucocytic and thrombocytic antigens, 3829; antibody formation and natural resistance in nutritional deficiencies, 3909.
See also Blood, groups; Haemolytic Diseases; and under names of specific diseases.
Complement and complement fixation. Effect of dextran of polyvinylpyrrolidone on g. pig complement, 137; effect of ethionine on complement titre in rabbits and g. pigs on high cholesterol diet, 194; kinetic studies of methods, 482-483; preparation and properties of pig complement, 862; effect of glucose and glycine on heat inactivation of complement, 863; removal of anticomplementary properties from human serum.1663; effect of caffeine on complement and blood coagulation, 1998; methods of viral and rickettsial c.f. tests, 2328; bactericidal action of serum and complement, 2330; measurement of antibody response, 3184.
See also under names of specific diseases.
Maternal transfer. Route of transmission in rats, 3825; duration of capability of young rats to absorb antibody from milk, 3826; protein selection in the yolk-sac splanchnopleur of the rabbit, 3827.
See also Foot and Mouth Disease; Haemolytic Diseases; Mycobacterium Tuberculosis Infection; Myxomatosis.
Precipitation test. For the detection of horse meat, 610-611; for identification of big game animals, 2626.
See also Glossina; Streptococci, General; Swine Fever.
Vaccines. Beta propiolactone—inactivated virus vaccines, 478; vat method for preparation, 1989; action of aluminium hydroxide in vaccine, 2329; report to Indian Government on manufacture of vaccines, 3335.
See also under names of specific diseases.
INCLUSION BODIES. See Fowl Paralysis and Avian Leucosis Complex; Rinderpest.
INDIA. See Ascaris; Eimeria Infection; Haematuria, Bovine Chronic; Insemination, Artificial; Lymphangitis, General; Mycobacterium Tuberculosis Infection, general; Nematodiasis, Cerebrospinal; Poisoning, inorganic; plants; Reports; Schistosoma.
INDIGOFERA. See Poisoning, plants.
INFLAMMATION. Chemical mediators and cellular injury, 3293.
INFLUENZA.
General. Tissue culture of virus, 135; neutralization of lethal and teratogenic effects in chick embryos, 446; production of non-infective particles among virus, 823; the Myxovirus group, 1237; bacterial allergy and susceptibility in mice, 1614; noninfectious virus forms, 1987; antigenicity of inactivated virus, 2273; suppression in mice by xerosin, 2599; virus structure, 3779.
Cattle. Outbreak in Slovenia, 831; a mild form occurring in winter, 2288; antibody formation and propagation of Newcastle disease and bovine influenza viruses in bovine mammary gland, 3177.
Horses. Outbreak in Yugoslav army horses, 1243; accompanied by monocytosis, 2279; immunological relationship with virus abortion,2877; in race-horses, 3783.
Swine. Immunology and prophylaxis, 105; chick embryo culture and pathogenicity of virus, 106; a pneumotropic virus isolated from piglets, 838; lungworms as reservoir, 1262; in mid-western U.S.A., 1971; c.f. and c.f. inhibition test with fowl plague, Newcastle disease and swine influenza viruses, 2321; influenza, chronic pneumonia and diarrhoea in piglets, 2691; serological differentiation from equine virus abortion mumps and Newcastle disease, 2878.
INFRA-RED RAYS. See Mycobacterium Tuberculosis.
INSECTICIDES. See Parasiticides.
INSEMINATION, ARTIFICIAL. Report to the Government of India, 276; book, artificial insemination in farm animals, 327; in relation to sexual physiology, 618; in buffaloes, 2105; for improving Spanish sheep, 2111; factors influencing error in field trials, 2436; in Nigeria, 2438; in swine, 2439; recent advances, 2735; 3965; fertilization in fowls with pooled semen, 2736; in ewes in which oestrus and ovulation had been synchronized with progesterone and gonadotrophin, 3308; a review, 3635.
See also Pseudomonas; Reports, international; Semen and Spermatozoa; Trichomonas Infection, cattle; Vibrio Fetus Infection.
INTERNATIONAL ORGANISATIONS. See Committees, Conferences and Congresses; Foot and Mouth Disease, general; Reports, international.
INTERSPIRA SUILLA. See Spirochaeta Infection.
IODINE. Effect of phenothiazine and iodine on thyroid uptake of I^{131}, 248; 3007; availability to sheep, 542; deficiency in rats, 3565; effect on avian thyroid activity, 3566.
See also Blood, composition; Casein, Iodinated; Lungworms; Phenothiazine, for sheep; Thyroid Gland.
IRELAND, REPUBLIC OF. See Reports.
IRON. An iron-dextran haematinic, 247; metabolism in growing pigs, 2038; iron metabolism and erythrocyte life-span in copper-deficient pigs, 2968; distribution and fate in rabbits after i/v inj., 3008; haemin chromoproteins in copper and iron deficient swine, 3561; serum content and absorption in calves, 3562; plasma iron in beagles, 3563.
See also Teeth.
IRRADIATION. See Radiations.
ISONIAZID. Hyperazotaemia following treatment, 1778.
See also Actinobacillus; Mycobacterium Johnei Infection, Mycobacterium Tuberculosis Infection, treatment; tuberculin test.

ISOPROPYL PHENYLCARBAMATE. See Poisoning, inorganic.
ISOSPORA INFECTION. Life history of I. felis in kittens, 431; in dogs in Ceylon, 3432.
ISOTOPES, RADIOACTIVE. Procedures in laboratory animals, 654; use in animal science, 3328.
See also Mycobacterium Tuberculosis Infection, tuberculin test.
ISRAEL. See Leptospira Infection, general; Nematodiasis, Cerebrospinal; Poisoning, plants.
ITALY. See Brucella Infection, cattle; Giardia; Leishmania Infection; Leptospira Infection, general; Microsporum; Psittacosis-Lymphogranuloma Group; Rickettsia Infection, Q fever.

J

JAMAICA. See "Manchester Wasting Disease"; Man, Diseases of Animals Transmissible to and from; Reports.
JAPAN. See Encephalitis, Japanese; Leptospira Infection, cattle; Mycobacterium Johnei Infection; Psittacosis-Lymphogranuloma Group; Salmonella Infection, dogs; Skin, diseases; Swine, virus and rickettsial diseases.
JAUNDICE. Differential diagnosis from yellow fat in meat, 1807.
See also Distemper, Dog.
JOHNE'S DISEASE. See Mycobacterium Johnei Infection.
JOINTS. Repair of ruptured ligaments in the canine knee joint, 656; arthritis, periarthritis and periostitis in rats given adjuvants, 2391; healing in articular cartilage, 3294.
See also Bacteroides; Erysipelothrix Rhusiopathiae Infection; Haemophilia; Tendovaginitis-Arthritis Syndrome of Fowls.

K

KALA-AZAR. See Leishmania Infection.
KALMIA AUGUSTIFOLIA (LAUREL). See Poisoning, plants.
KANGAROOS. See Bacteroides; Vermin Control.
"KASEN" SKIN DISEASE. See Skin, diseases.
KEDROWSKY'S BACILLUS. See Leishmania Infection.
KENYA. See Cysticercus; Fusiformis Infection; Phosphorus; Pleuropneumonia, Bovine Contagious; Reports, East Africa; Rift Valley Fever.
KERATOCONJUNCTIVITIS, BOVINE INFECTIOUS. See Rickettsia Infection, cattle.
KERATOCONJUNCTIVITIS, GENERAL. See Eyes, diseases.
KETOSIS. A.C.T.H. treatment, 214; 3242; treatment in ewes with piromen, a Pseudomonas polysaccharide, 545; treatment, 546-548; sodium propionate treatment, 936; 1369; sodium ethyl oxalacetate treatment, 937; effect of acetic, propionic and butyric acid on ketone body levels and blood glucose in goats, 938; nervous symptoms, 1367; evaluation from the practitioner's standpoint, 1368; potassium permanganate treatment, 1370; method for determination of acetone in cattle urine, 1735; 3917; in dairy cows, 1736; neurophysiology, 1737; evaluation of treatments, 1738; study of mechanism of ketone body formation, 2047; 2689; "meticorten" treatment, 2048; i/m treatment with "cortef" (hydrocortisone), 2690; diagnosis by the Lestradet test, 3238; carbohydrate metabolism, 3240; in relation to parathyroid insufficiency, 3581; grass silage, a possible factor, 3915; role of adrenal cortex, 3916.
See also Blood, composition.
KETOSTEROIDS. See Sex Hormones, steroids.
KIDNEYS. Acid-base balance in chicks, 1002; glomerulonephritis in the pig, 1383; chronic interstitial nephritis in dogs, 1385; the pituitary and adrenal glands in chronic nephritis of dogs, 1386; cystic bile ducts and renal tubules in piglets, 1459; lesions in calves caused by xanthine, 1758; morphology and symptoms of nephroses, in dogs, 2389; experimental pyelonephritis, produced by B. coli and Ps. pyocyanea, 2547; "white-spotted kidney" in calves, 2989; glomerulotubular nephrosis correlated with hepatic lesions, 3255; exp. interstitial nephritis in dogs caused by lithium carmine stain and Staph. aureus toxin, 3617; role of adrenal cortex in exp. nephrocalcinosis, 3899; chronic nephritis and calcium metabolism in dogs, 3900; transplantation experiments in dogs, 3956.
See also Candida; Capillaria; Clostridium Infection, cattle; Leptospira Infection, in dogs and cats; Pregnancy Toxaemia; Nutrition, general; Poisoning, organic; Sex Hormones, oestrogens.
"KISENYI DISEASE." A tick-borne virus disease in sheep, 2293.
'KHUTILI" DISEASE. In cattle in the Georgian S.S.R., 3583-3584.
KLEBSIELLA. Cause of acute mastitis in cattle, 3092; 3375-3376; isolation together with Bact. coli from cows with mastitis, and relationship with infantile enteritis, 3093.
KUMRI. See Setaria.

L

LACTATION. Complementary milk, 601; neural pathways, 3280; following ablation of posterior pituitary lobe in rats, 3950; induced in ewes, 3988.
See also Bones, general; Butyrate; Casein, Iodinated; Ergotamine; Foot and Mouth Disease, general; Glyceryl Trilaurate; Milk and Milk Products; Poisoning, plants; Sex Hormones, general.
LACTOBACILLI. See Digestive System, fauna and flora.
LAMBS. See Sheep.
LAMENESS. Fluorohydrocortisone treatment of certain lamenesses in horses, 2692.
See also Heredity, of disease; Poisoning, plants.
LANGHANS' CELLS. See Mycobacterium Tuberculosis Infection, general.
LARYNGO-ENTERITIS, FELINE INFECTIOUS. Brain lesions, 842.
LARYNGOTRACHEITIS, AVIAN INFECTIOUS. In Malaya, 1279; disinfection of air, 1280; vaccination with virus of low virulence, 3503.
LATHYRUS. See Poisoning, plants.
LAUREL (KALMIA). See Poisoning, plants.
LAW. Liability of food inspector, 374; international regulations in livestock trade, 3962.
See also Pregnancy, diagnosis.
LEAD. See Poisoning, inorganic.
LEBANON. See Rickettsia Infection, Q fever.
LEISHMANIA INFECTION. In dogs in Yugoslavia, 786; in dogs in Madrid, 1211; kala-azar c.f. test, with extracts of Kedrowsky's bacillus as antigens, 1923; in the Sudan, 2569; canine and human infection in Palermo, 2843.
LEPTOSPIRA AUSTRALIS. See Leptospira Infection, general.
LEPTOSPIRA CANICOLA. See Leptospira Infection, general; dogs and cats.
LEPTOSPIRA INFECTION.
General. Immunization against L. pomona, 391; epidemiology, 394; cultivation, 396; rapid agglutination test, 756; protection of g. pigs with gamma globulin, 759; experimental avian infection, 761; 1554; 3722; in domestic animals, 1167; 2541; in Israel, 1168; an epidemic in Macedonia, 1549; foci in Hungary, 1550; carbomycin treatment, 1553; preparations used for control in the U.S.S.R., 1555; local reaction to trypaflavine vaccine, 1556; serotypes in Australia, 1885; survival of L. australis in soil and water, 1886; haemolysis of sheep r.b.c. sensitized with extracts, 1887; electron microscopical structure, 2202; incidence in animals in Tuscany, 2203; effect of external factors on incidence and spread, 2204; serological diagnosis and epidemiology of L. australis infection, 2209; muscular lesions, 2210; presence of haemolysin in cultures, 2211; antileptospiral effect of milk, 2212; effect of antibiotics, 2213; 2214; L. canicola infection in man, probably from pigs, 2542; role of calves in transmission of L. pomona to other animals, 2807; L. canicola infection in man in East Germany, 2808; L. canicola infection in man from dogs, 2810; lysis by antiserum, 2811; in piggery workers, 3115; L. australis B infection in g. pigs, 3116; urinary antibodies, 3117; serological diagnosis, 3399; c.f. test, 3400-3402.
Cattle. Control by a bacterin, 392; vaccine, 393; in Central Africa, 755; in Hungary, 757; serological study, 1169; in Japan, 1170; 2206; isolation of L. pomona from aborted foetuses, 1171; c.f. test for diagnosis, 1551; survival in semen extender, 1552; in calves in Northern Ireland, 1881; antibiotic treatment, 1882; causing meningitis, 2207; role of calves in transmission of L. pomona to other animals, 2807; exp. L. pomona infection in pregnant heifers, 3398.
Dogs and Cats. In cats, 47; 760; L. canicola furunculosis, in dogs, 395; L. canicola as cause of chronic nephritis in cats, 2809; a review, 3403; exp. study in dogs, 3404-3405.
See also Leptospira Infection, general.
Horses. Evaluation of serum titres, 290; and encephalitis, 754 and periodic ophthalmia, 1172; c.f. test for diagnosis, 1551; comparison of spontaneous and experimental infection, 1880; serological survey, 2205; in France, 2806.
Swine. Causing abortion, 758; 2208; in the U.S.A., 1173; and abortion in Australia, 1883-1884; control, 3114; in piggery workers, 3115; exp. infection in pregnant sows, 3721.
See also Leptospira Infection, general.
LEPTOSPIRA POMONA. See Leptospira Infection, general; Semen and Spermatozoa, diluents and additives.
LESTRADET TEST. See Ketosis.
LEUCOCYTOZOON INFECTION. Pathology in turkeys, 811; Leucocytozoon, Haemoproteus and microfilariae in wild and domestic ducks in Maine, 1300; in turkeys, and Simulium as vector, 2631.

LEUCOSIS.
General. In dogs and cats, **1337**; in animals, specially cattle, **2653**; exp. monocytic leucaemia in rabbits, **2656**; susceptibility of certain strains of mice, **3870**.
Avian. See Fowl Paralysis.
Bovine. Predisposition, **173**; aetiology and control, **1336**; triethylenemelamine treatment of bovine lymphadenosis, **1338**; diagnosis, **1692**; environmental conditions for lymphadenosis in Sweden, **1693**; electrophoretic examination of blood proteins, **1739**; morphology of leucocytes and diagnosis, **2025**; animal leucoses, with reference to cattle, **2653**; role of nutrition, management and carcinogens, **2654**; transmission and control, **3220-3221**; causes and control, **3222**.
See also Hygiene, food.
Canine. Stem cell leucosis, **1337**; a description, **3869**.
Porcine. Study of 30 cases, **2356**.
LEUCOVORIN. See Cobalt.
LEVALLORPHAN. A specific antagonist of morphine, **3010**.
LEVOMYCETIN. See Salmonella Infection, cattle.
LICE. Control by insecticides, **1666**; houseflies transmitting mites and Polyplax spinulosa, **1676**; back-rubbers impregnated with chlordane, **2333**; insecticide-treated rubbing devices for cattle, **2922**; oviposition in Damalinia ovis, **2923**.
LIGHT. See Eggs, Hen.
LIMNAEA. Control of L. truncatula, **2636**.
LINDANE (BENZENE HEXACHLORIDE). See Megninia; Parasiticides; Poisoning, organic.
LIPASE. See Enzymes, General.
LIPOPTENA. L. servi in Scottish reindeer, **145**.
LISTERIA. See Erysipelothrix Monocytogenes Infection.
LITOMOSOIDES. Stimuli affecting migration of microfilariae of L. carinii, **3861**.
LIVER.
General. Failure of glycogen deposition in livers of scorbutic g. pigs, **208**; hepatic lymphatic structure in pigs, **1803**; nuclear and cytoplasmic liver cell volumes in foetal sheep, **2429**; glycogen determination by biopsy in cattle, **2978**; ketogenesis in liver injury, **3914**.
See also Copper; Foot and Mouth Disease, general; Nutrition, general; Vitamins, vitamin A; Yeasts.
Bile. Cystic bile ducts and renal tubules in piglets, **1459**; book, bile pigments, **1481**; histamine content in cattle, **2723**; bile pigments in the urine of domestic animals, **3254**; quantitative analysis of bilirubin in serum, **3289**.
Diseases. Telangiectasis in cattle, **222**; hepatitis in fowls caused by an unidentified infectious agent, **229**; traumatic splenitis and hepatitis in cattle, **557**; nervous symptoms, **571**; blood-ammonium levels in liver disease, **572**; hepatitis of unknown aetiology in dogs in the U.S.A., **913**; hepatitis in piglets, **954**; histology in fowls with enteritis, **958**; icterus index, **1379**; toxic dystrophy in pigs, **1712**; effect of cortisone and A.C.T.H. on necrosis, **2076**; hepatitis in pigs, **2696**;**2697**; cirrhosis in nutria, **2701**; book, hepatic histopathology, **3052**; glomerulotubular nephrosis correlated with hepatic lesions, **3255**; development of fatty liver in partial threonine deficiency, **3556**; massive necrosis in sheep, **3880**; production of ammonium and amines by intestinal bacteria in relation to nitrogen as a factor in hepatic coma, **3887**; pathology of veno-occlusive disease, **3935**.
See also Abortion, General; Clostridium Infection, cattle; sheep; Echinococcus; Erysipelothrix Monocytogenes Infection; Fasciola; Fusiformis Infection; Gigantocotyle; Hepatitis; Hygiene, food; Jaundice; Poisoning, general; organic; plants; Protozoa, General; Swine Fever.
Gallbladder. Cholecystoduodenostomy in cows, **655**; i/v cholecystography in dogs, **3957**.
LIVER FLUKE. See Fasciola.
LLAMAS. See Mycobacterium Johnei Infection.
LUCERNE. See Genital System, ovaries, ova and ovulation; Poisoning, plants.
LUMBAR PARALYSIS. See Setaria.
"LUMPY WOOL." See "Streptothricosis."
LUNGWORMS. Treatment, **162**; **884**; **1681**; **1682**; aerosols, **490**; **1325**; acting as reservoir of swine influenza virus, **1262**; life cycle and treatment in sheep, **2015**; bovine parasitic bronchitis, **2346**; **2939**; Lugol's iodine for sheep, **2941**.
See also Anthelmintics, for sheep and goats; Dictyocaulus; Metastrongylus.
LUPINS. See Poisoning, plants.
LYMPHADENITIS, PORCINE CASEOUS. Caused by an unspecified mycobacterium, **714**; exp. infection with an organism tentatively named Mycobact. suis, **3685**.
LYMPHADENOSIS, BOVINE. See Leucosis, Bovine.
LYMPHANGITIS, EPIZOOTIC. See Histoplasma Farciminosum Infection.
LYMPHANGITIS, GENERAL. In cattle in Madras, **2693**.
LYMPHATIC SYSTEM. Efficiency of popliteal lymph nodes in rabbits, **600**; in the liver of pigs, **1803**; output of lymphocytes in the rabbit, **3287**; lifespan of lymphocytes in the rabbit, **3288**; avian lymphoid and haemopoietic tissue, **3874**; lymph node extract and lymphocytosis, **3948**.
See also Candida; Chlortetracycline; Pneumonia, Porcine Virus; Poisoning, organic.
LYMPHOMATOSIS, VISCERAL. See Fowl Paralysis.
LYPEROSIA. See Siphona.

M

MAGNAMYCIN. See Rickettsia Infection, dogs.
MAGNESIUM. Deficiency and ruminal ammonia, **199**; fatal tetany in ewes, **202**; energy and carbohydrate metabolism in deficient calves, **531**; binding to serum albumin, **532**; grass tetany, **922**; grass tetany in ewes, **923**; effect of pasture dressing on blood level in cows, **1719**; absorption from ovine alimentary canal, **1720**; effect of weather on grass tetany in cattle, **2360**; prevention of grass tetany in cattle by magnesium oxide in oil cake, **2672**; effect of vitamin D on absorption, **2681**; serum content in hibernation, **2719**; effect of low temp. and calcium on magnesium requirement, **2965**; components of total content of white clover and ryegrass, **2966**.
MAIZE. See Growth, general.
MALARIA. See Plasmodium Infection.
MALATHION. Fate of P^{32} labelled malathion in fowls, mice and cockroaches, **3189**; use in cats and birds, **3514**.
See also Bdellonyssus; Mange, swine, Ticks, Ixodidae.
"MALATHON." See Poisoning, organic.
MALAYA. See Anaemia, General; Laryngotracheitis, Avian Infectious; Rabies; Reports; Wuchereria.
MALLEOMYCES. See Pfeifferella.
MAMMARY GLAND. Radiological study in goats, **558**; in Equidae, **1422**; therapeutic effect of udder anaesthesia, **1782**; survival and growth of lambs from ewes with defective udders, **1824**; radiographic study of function in cows, **2424**; hereditary lack of milk caused by hypoplasia of glandular parenchyma, **2455**; exp. mammary malformation in mouse embryos by sex hormones, **3032**; in vitro study of tissue, **3281**; periductal lobules of the bovine mammary gland, **3949**; response to local prolactin in rats, **3951**.
See also Adrenal Gland, cortical hormones; Bacterium Coli; Circulatory System, vessels; Corynebacterium Infection, cattle; swine; Dermatitis, Contagious Pustular; Immunology, Antibodies and Antigens; Lactation; Mastitis; Milk Fever; Milk and Milk Products; Mycobacterium Tuberculosis Infection, immunology; Neoplasms; Newcastle Disease, immunology; Sex Hormones, general; Staphylococcus Infection; Vitamins, vitamin A; Yeasts.
MAN, DISEASES OF ANIMALS TRANSMISSIBLE TO AND FROM. In the West Indies, **550**; avian diseases transmissible to man, **2377**; virus diseases, **2910**; in Czechoslovakia, **2980**; book, zoonoses and rural health, **3051**; occupational diseases and accidents in Poland, **3298**.
See also Abortion, Ovine Virus; Anaemia, Equine Infectious; Bacterium Coli; Brucella Infection; Brucella Melitensis Infection; Brucella Tularensis Infection; Dermatitis, Contagious Pustular; Encephalitis, Japanese; Foot and Mouth Disease, immunology; Hepatitis, Canine Virus; Leishmania Infection; Leptospira Infection, general; Mycobacterium Tuberculosis Infection; Newcastle Disease, general; Pox Diseases, cow pox and vaccinia; Psittacosis; Psittacosis-Lymphogranuloma Group; Rabies, general; Salmonella Abortus-Ovis Infection; Salmonella Infection; Staphylococcus Infection; Stomatitis, Vesicular; Streptococcus Infection, cattle; Toxoplasma Infection; Trichophyton; Vibrio Fetus Infection.
"MANCHESTER (JAMAICA) WASTING DISEASE." In Jamaica, **3889**.
MANGANESE. Effect on blood picture and growth in rabbits, **535**; role in nutrition of young cattle, **921**; effect of dietary manganese and thiamine on tissue conc. and growth in rats, **1360**; effect on haemoglobin formation, **2039**; bones of deficient swine, **2369**.
MANGE.
General. Defence reaction in rabbits to psoroptic mange, **148**; transmission by houseflies of Psoroptes, Notoedres and the louse Polyplax spinulosa, **1676**; treatment with sodium thiosulphate and sodium bisulphate, **2004**.
See also Cnemidocoptes.
Cattle. Demodectic, **1317**; control of psoroptic mange, **2928**; chorioptic, **3193**.
Dogs. Treatment of Demodex follicularum infestation with i/v inj. of trypan blue, **3843**.
Goats. Demodectic, **1318**.
Sheep. Treatment with a creolin-B.H.C. mixture, **1672-1673**.
See also Psorergates.
Swine. Malathion for sarcoptic mange, **2336**.
MANGOLDS. See Poisoning, plants.
MARROW. See Bones.
MAST CELLS. See Neoplasms, general.

MASTITIS, BOVINE.
General. In Australia, 316; test for detection of Str. agalactiae in milk, 332; eradication of Str. agalactiae, 334; experimental research, 676; hibitane, a disinfectant, 677; New York State control programme, 1094; milk cell count as diagnostic aid, 1095; immunological studies, 1484; Whiteside test for milk, 1485; control, 2153; micrococcal infection, 2766; sanitation in micrococcal mastitis, 3057; CAMP test and T.K.T. medium, 3061; effect of Str. agalactiae infection on milk yield, 3062; data on incidence, 3341-3345; in report, West of Scotland Agric. College, 3650; amylase content of milk in acute and chronic mastitis, 3667.
See also Bacterium Coli; Corynebacterium Infection; Klebsiella; Pseudomonas; Staphylococcus Infection; Yeasts.
Treatment. Neomycin sulphate, 2; ultrasonic treatment, 678; local reaction from infusion of aqueous solution of potassium penicillin, 1091; a syringe for treatment, 1096; by suffusion, 1098; hydrocortisone infusion, 1483; a discussion, 2154; treatment and prevention of mastitis following F. and M. disease, 2262; oxytetracycline, 2767; chlorophenylguanidohexane and other drugs, 2768-2769; effect of antibiotics on cell content of milk, 3346; procaine, 3668.
MASTITIS, CAPRINE. See Staphylococcus Infection.
MASTITIS, OVINE. See Pasteurella Infection, sheep.
MAURITIUS. See Reports.
MEAT INSPECTION. See Books; Hygiene, food.
"MEGIMIDE." See Anaesthesia and Analgesia.
MEGNINIA. Control of M. cubitalis in fowls by lindane (B.H.C.), 2930.
MELANOMA. See Neoplasms.
MELIOIDOSIS. See Pfeifferella Whitmori Infection.
MENADIONE. See Haemorrhagic Syndrome, Fowls; Milk and Milk Products.
MENINGOENCEPHALITIS. See Mycobacterium Tuberculosis Infection, general; Poisoning, inorganic.
M.E.P.A. See Neoplasms, general.
MEPACRINE. Antiviral property, 2277; distribution in organs, metabolism and possible antiviral activity, 3462-3463.
MERCURIALIS. See Poisoning, plants.
METASTRONGYLUS. Studies on pig lungworms, 885; 3858.
METHIONINE. See Cannibalism; Growth, growth factors; Hypoglycaemia.
METHONIUM. As cause of aortic aneurysms, 2066.
METHOPTERIN. See Choriomeningitis, Lymphocytic Murine.
METHYL BROMIDE. See Poisoning, organic.
METHYLOESTRENOLENE. Progesterone-like action, 3972.
"METICORTEN." See Ketosis.
METRITIS. See Genital System, uterus.
MEXICO. See Anaemia, Equine Infectious; Rabies.
MICE. See Choriomeningitis, Lymphocytic Murine; Coryne bacterium Infection, general; Diarrhoea; Encephalomyelitis, Mouse; Genital System, general; Haplosporangium; Hepatitis, Mouse Virus; Pneumonia, General; Pneumonitis, Mouse Virus; Pox Diseases; Protozoa, General; Psorergates; Tyzzer's Disease; Zootechny.
MICROCOCCUS. Taxonomy of Micrococcus and Staphylococcus, 330-331.
See also Mastitis, Bovine.
MICROSPORUM. M. lanosum (M. canis) infection in dogs, cats, and rabbits, 60; in dogs, 61; causing onychomycosis in cats, 62; "M. cornua bovis" causing horn disease in Italian cattle, 1567; M. canis infection in kittens, 2230; public health significance of feline ringworm, 3125.
MICROTOMY. See Technique, miscellaneous.
MIESCHER'S TUBES. See Sarcosporidia.
MILK AND MILK PRODUCTS. Composition in cows with fever, 602; effect of dietary aureomycin, 809; book, bacteria in relation to milk supply, 1083; effect of menadione on keeping quality, 1423; milk yield and fertility in cattle, 1452; effect of vacuum milking on udder health, yield, milking time and rate of flow, 1794-1795; antituberculous factor in milk, 2169; antileptospiral effect of milk, 2212; origin of milk fat, 2722; effect of certain afebrile conditions on quantity and composition, 3585; apparent periodicity in body temp., blood picture and daily milk yield in cows, 3629; dictionary of dairying, 3660; amylase content in cows with acute and chronic mastitis, 3667; oxytetracycline levels in sow's milk following oral and i/m administration, 3879; antibiotics in market milk, 3958; report, National Institute for Research in Dairying, Reading, 3997.
See also Acetylcholine; Brucella Infection, general; cattle; Butyrate; Lactation; Mastitis, Bovine; Mycobacterium Tuberculosis; Mycobacterium Tuberculosis Infection; Nutrition, general; Phosphatase; Rabies, general; Sex Hormones, general; Staphylococcus Infection; Streptococcus Agalactiae; Temperature, environmental; Tetrazolium-Reduction Test; Toxoplasma Infection; Vitamins, vitamin A; vitamin C.
MILK FEVER. Biochemical and clinical aspects, 544; pathogenesis, prophylaxis and treatment, 934; calcium laevulinate treatment, 935; in dairy cows, 1734; prevention of relapses, 2046; prevention by vitamin D, 2688; udder insufflation, 3239.
See also Calcium; Phosphorus.
MILKER'S NODULES. See Pox Diseases, cow pox.
MINK. Osteology and myology, 1802; book, biology, diseases and breeding, 3659.
See Clostridium Botulinum Intoxication; Distemper, Mink; Enteritis, Feline; Enteritis, Mink; Salmonella Infection, general; Toxoplasma Infection; Urinary System, diseases; Yeasts.
MITES. See Bdellonyssus Sylvarum; Cnemidocoptes; Dermanyssus; Mange; Megninia; Nutrition, in relation to disease; Psorergates.
MIYAGAWANELLA. See Pneumonitis, Feline; Psittacosis-Lymphogranuloma Group.
MOLLUSCICIDES. Automatic dispenser for use in flowing water, 3848.
See also Australorbis; Limnaea; Schistosoma.
MOLYBDENUM. And animal health in New Zealand, 2368; toxicity in rats, 2970.
See also Copper.
MONGOOSE. See Babesia Infection.
MONIEZIA. M. expansa in a lamb, 3849.
MONILIASIS. See Candida.
MONKEYS AND APES. See Adrenal Gland, general; Hepatitis, Canine Virus; Mycobacterium Tuberculosis Infection, general; Salivary Glands.
MOROCCO. See Bartonella; Pneumonia, Porcine Virus.
MORPHINE. Levallorphan, a specific antagonist, 3010.
"MORPHIPLASMIN." See Theileria Infection.
MORTIERELLA. See Fungi General.
MOSQUITOES. Vectors of Onchocerca, 1331; report, East Africa, 1988.
See also under names of individual mosquitoes; Books, parasitology; Encephalomyelitis, Equine; Myxomatosis; Viruses, General.
MOTION SICKNESS. Experimental, in dogs, 267.
MOULDS. See Fungi, General.
MOULTING. Induction by aminonitrothiazole, 2133.
MOUTH. Horse disease in Honduras affecting the corners of the mouth, 216.
MUCOR. See Fungi, General.
MUCOSAL DISEASE. Purdue Conference report, 220; a description, 555; in North Dakota, 1377; in Ontario, 1747; "virus diarrhoea - Indiana," a transmissible disease affecting mucosae of cattle, 1964; pathology, 2055; experimental studies, 3471; clinical aspects and pathology, 3472; in Pennsylvania, 3788; in Virginia, 3789; in deer, 3790.
See also "Muzzle Disease."
MULES. See Horses, Donkeys and Mules.
MUMPS. See Viruses, General.
MUSCLES. Variation of pH in pig muscle, 1424; oxidation-reduction potential of equine sterno-cephalicus muscle in relation to bacterial growth, 1425; "muscular degeneration" in pigs, 1731; osteology and myology in mink, 1802; growth of bacteria on horse muscle and rigor mortis, 1806; bovine muscular dystrophy and unsaturated fats, 2973; muscular dystrophy in sheep in Scotland, 3554; muscular dystrophy in lambs associated with tocopherol levels in milk and plasma in dams, 3903.
See also Anaesthesia and Analgesia; Leptospira Infection, general; Myositis, Eosinophilic; Sarcosporidia; White Muscle Disease.
"MUZZLE DISEASE." In Pennsylvania and Delaware, 2056.
See also Mucosal Disease.
MYCOBACTERIA, GENERAL. Staining, 17; "stain acid-fastness," 18; allergy in mycobacterial infections, 349; action of stains, 1121; differentiation by agar culture, 1859; behaviour in chick and duck embryos, 2172; classification by mycobacteriophages, 2493; pathogenicity of M. balnei and M. ulcerans for mice and chick embryos, 3087; infection of chick embryos, 3360.
See also Lymphadenitis, Porcine Caseous.
MYCOBACTERIUM JOHNEI INFECTION. In a llama, 19; in sheep, 350; diagnosis by the c.f. test, 708; 1123; uterine and congenital infection, 709; in apparently healthy cattle, 710; sedimentation rate, 711; in a lamb, 712; in the Belgian Congo, 713; diagnosis, 1122; examination of ileo-caecal lymph nodes in Australian cattle, 1860; failure of isoniazid and streptomycin to prevent infection in calves, 1861; suspected infection in imported cattle in Japan, 2174; micro-c.f. test, 2175; treatment, 2176; use of Hole's test in New Zealand, 2494; isolation from faeces, 2495; immunological problems, 2496; experimental infection in mice, 2779; congenital infection in cattle, 3088; reaction of cattle with "skin lesions" to johnin, 3249; use of c.f. test in the field, 3361; diagnosis and treatment with sulphone and isoniazid, 3362; isoniazid treatment, 3363; infection of hamsters and rabbits, 3364; incidence, diagnosis and control, 3686; survival of M. johnei under various conditions, 3687.

"MYCOBACTERIUM SUIS." See Lymphadenitis, Caseous Porcine.

MYCOBACTERIUM TUBERCULOSIS. Types isolated from pork carcasses, **10**; effect of pasteurization on virulence, **12**; media for rapid culture, **341**; use of mice for detection of small numbers, **342**; slide culture-mouse tissue technique, **694**; chamber culture method, **695**; counting, **696**; infra-red spectrum as means of differentiation of human and bovine strains, **697**; drug resistance and virulence, **1120**; strains isolated from pigs in Roumania, **1494**; a new blood medium, **1508**; specific polysaccharides, **1509**; proteins of tubercle bacilli and tuberculin, **1510**; growth forms in microcultures, **1511**; identification of bovine type organism by phase-contrast microscopy, **2163**; use of caustic soda in isolation, **2164**; differential resistance of types to disinfectants, **2171**; allergic encephalomyelitis in g. pigs by tubercle bacillus residues, **2488**; tuberculin from bovine type culture filtrates, **2490**; tuberculin-producing ability of some strains, **2491**; growth in liquid media, **3086**; preparation and counting of viable suspensions, **3359**.

MYCOBACTERIUM TUBERCULOSIS INFECTION.

General. In bison, **9**; localized and generalized infection in fowls, **11**; in Australia, **316**; **3065-3071**; conference of International Union against TB., **338**; in zebu in the Punjab, **339**; T.B. and sewage, **345**; rearing stations for TB.-free calves, **346**; skim milk and rearing of TB.-free calves, **347**; effect on life span and progeny of cattle, **692**; from cattle in Bavarian children, **693**; disinfectant action of glycols, **705-706**; eradication in the U.S.A., **1105**; eradication by districts in the U.S.S.R., **1106**; pathology of bovine tuberculous leptomeningitis, **1107**; in rhesus monkeys, **1108**; rendering infected soil harmless, **1116**; bovine-type infection in man in the U.S.A., **1118**; aerogenous infection in pigs, **1495**; effect of diet on experimental infection in mice and g. pigs, **1506-1507**; electrophoretic examination of blood proteins in infected cattle, **1739**; control of bovine TB. in the Union of South Africa, **2160-2161**; incidence of bovine type in man, **2165**; eradication in fowls, **2168**; tubercle bacilli in muscles and lymph nodes in cattle with localized lesions, **2481**; ruminal TB. in a cow, **2482**; silver-positive reticulum in human tubercules, **2489**; in domestic animals in French overseas territories, **2771**; "skin lesions" in an ox, **2987**; relation between positive test in children and distribution in cattle, in Germany, **3075**; in pigs, **3076**; pathology in sheep, **3077**; in goats in France, **3076**; in dogs, **3079**; chronic infection in experimental animals, **3080**; effect of phagocytic stimulation on TB. in g. pigs, **3081**; control in cattle in West Germany, **3348**; in cattle from man, **3353**; in children from milk, **3354**; pathogenesis studied in the omentum, **3355**; maintenance of a colony of infected monkeys, **3356**; infectivity of eggs from reactor ducks, **3357**; report, Republic of Ireland, **3654**; book, relationship between human and bovine infection, **3657**; eradication in North Rhine-Westphalia, **3675**; re-infection of TB.-free herds, **3676**; danger of contaminated pastures, **3677**; byre disinfection and control, **3678**; germicidal effect of cetylpyridium chloride (a quaternary ammonium compound), **3679**; chemoprophylaxis, immunity and prevention, **3680**; Langhans' cells in tuberculous granulation tissue, **3681**; diet and experimental infection in g. pigs, **3683**.

Diagnosis (other than tuberculin test). Diagnostic value of milk-sediment microscopy, **1500**; by fluorescence microscopy, **1501**; by coupling protein antigens to r.b.c., **1502**; new antigen, **1850**; haemagglutination test, **1851-1852**; microculture, **1853**; rapid g. pig test, **2483**; examination of tracheal mucus in cattle, **3072**; disinfectants, **3085**; killed vaccine and hyaluronidase for diagnosis in cattle, **3349**; diagnosis of bovine type by slide culture, **3682**.

See also Mycobacterium Tuberculosis.

Immunology. Inoculation of hamsters with B.C.G., **15**; detection of circulating antibodies, **16**; haemagglutination test in TB. and brucellosis, **56**; of cattle with Strain P (Gräub), **348**; prevention in man and cattle, **688**; electrophoresis of infected cattle serum, **689**; milk and serum haemagglutinin and haemolysin titres in mammary TB., **690**; antibody levels in cows at parturition and maternal transfer, **691**; milk and whey haemagglutination and haemolysis, **700**; genetic resistance, **702**; antibody demonstration, **707**; body temp. reaction to tuberculin in normal and B.C.G. treated g. pigs, **991**; complement-fixing antigens, **1114**; haemagglutination test, **1115**; vaccination with "strain P," **1117**; specific polysaccharides of tubercle bacilli, **1509**; allergy, **1855**; modified B.C.G. for calves, **1856**; comparison of tubercle bacilli extracts and B.C.G., **1857**; methanol extracts of tubercle bacilli, **1858**; resistance in mice infected with Br. abortus, **2170**; use of B.C.G., various tuberculins and testing methods in cattle, **2772**; serology of mycobacterial antigens, **2777-2778**; new vaccine, **3083**; M. tuberculosis var muris and B.C.G., **3084**; vaccination, **3351-3352**.

See also Mycobacterium Tuberculosis Infection, diagnosis; tuberculin test.

Treatment. Effect of iso-nicotinic acid hydrazide on blood picture of infected cattle, **13**; antituberculous factor in milk, **2169**; reactivation of lesions after cure by isoniazide, **2776**.

See also Mycobacterium Tuberculosis Infection, tuberculin test.

Tuberculin test. Following iso-nicotinic acid treatment in infected calves, **14**; effect of antihistamines, in cattle, **340**; incidence of tubercle bacilli in byres of positive cattle, **343**; presence of tubercle bacilli in faeces of positive cattle, **344**; mammalian and avian type tuberculin, **698**; demonstration of tubercle bacilli in positive cattle free from lesions, **699**; in sheep, **701**; following treatment with iso-nicotinic acid hydrazide, **703**; body temp. reaction to tuberculin in normal and B.C.G. treated g. pigs, **991**; in relation to pathology, **1109**; effect of external factors and reliability, **1110**; evaluation of avian tuberculin, **1111**; in geese and ducks, **1112**; biological assay of tuberculin, **1113**; hypersensitivity, **1119**; antibody production during reaction, **1496**; skin-activating and haemosensitizing properties of P.P.D., **1497**; haemorrhagic reaction in cattle, **1498**; cellular transfer of sensitivity, **1499**; uptake of isotope-tagged tuberculin by w.b.c., **1503**; repeated i/d and i/v inj. of tuberculin for diagnosis of avian infection, **1504-1505**; proteins of tuberculin and tubercle bacilli, **1510**; and pregnancy, **1854**; actinobacillosis as cause of non-specific reaction, **1914**; sensitivity in attested herds, **2162**; passive transfer of hypersitivity in g. pigs, **2166**; simultaneous allergy and tubercle formation in g. pigs, **2167**; P.M. confirmation in reactors without lesions, **2484**; milk supply and testing scheme, **2485**; differentiation of non-specific g. pig reactions, **2486**; in fowls and control, **2487**; O-aminophenol azo tuberculin from bovine type culture filtrates, **2490**; tuberculin-producing ability of some strains, **2491**; factor in arachis oil depressing sensitivity in B.C.G.-infected g. pigs, **2492**; reliability of the intradermal test, **2773**; significance of lesions in lymph nodes in tuberculin reactors, **2774**; doubtful reactions and supplementary tests, **2775**; non-specific reactions in cattle, **3073**; leucocyte picture in cattle during test, **3074**; specifity of wattle test, **3082**; reaction of cattle with "skin lesions" to bovine and avian tuberculin and to johnin, **3249**; effect of the tuberculin test on c.f. reaction in tuberculous cattle, **3350**; tuberculin sensitivity and adrenocortical function in man, **3358**; effect on cornea tissue culture of sensitive g. pigs, **3684**.

MYCOTIC DERMATITIS, OF SHEEP. See "Streptothricosis."

MYELITIS, INFECTIOUS FELINE. Of unknown aetiology, **3252**.

MYOSITIS, EOSINOPHILIC. Examination of the c.s. fluid in dogs, **957**; in dogs, **2060**; **2699**.

MYXOMATOSIS. Pathology and histology, **112**; **3487**; attenuated strains, **113**; **3812**; maternal transfer of immunity, **464**; attenuated strains in Britain, **843-844**; attenuated strains in Europe, **845**; in hares, **1637-1638**; **2307**; attenuated virus in France, **1639**; outbreak in a laboratory in Argentina, **1640**; observations in Australia, **1641**; **2615**; in rabbit skins, **1642**; duration of immunity by Shope's fibroma, **1643**; biological assay of virus, **2308**; changes in virulence, **2616**; factors influencing mosquito transmission, **2617**; change in resistance in rabbits, **2618**; mosquito vectors in the Eastern Riverina, **2899**; mosquito and mechanical transmission, **3488-3489**; virus titration in rabbits and chick embryos, **3490**.

MYXOVIRUS GROUP. See Viruses, General.

N

NAILS. See Trichophyton.

NALORPHINE. See Anaesthesia and Analgesia.

NAVEL. Omphalitis in baby chicks, **2064**.

NEMATODIASIS, CEREBROSPINAL. See Setaria.

NEMATODIRUS. Life cycle of N. helvetianus, reaction to temp. of larvae of N. filicollis, **3209**; in report, West of Scotland Agric. College, **3650**; observations in Northumberland and Durham, **3854**.

See also Phenothiazine.

"NEMBUTAL." See Anaesthesia and Analgesia.

NEOASCARIS. See Ascaris.

NEOMYCIN. For veterinary use, **590**; sensitivity of some microorganisms, **2225**.

See also Mastitis, Bovine, treatment.

NEOPLASMS.

General. Skin tumours in dogs, **171**; **2651**; cancer, a basic pathological phenomenon, **510**; local eosinophilia and malignant tumours, **511**; book, cancer research, **1074**; heart base tumours in dogs, **1690**; of the brain in cats, **1691**; intestinal tumours in dogs, **2024**; pathologic growth and parasitic disease, **2049**; differentiation of pulmonary

NEOPLASMS—General—[cont'd]
metastases of uterine adenocarcinoma in cows from primary lung tumours, **2351**; of the canine stomach, **2354**; treatment in small animals, **2650**; treatment in dogs with M.E.P.A., **2652**; book, cancer in man and animals, **3336**; spontaneous tumours in domestic animals, **3540**; classification of 636 tumours in domestic animals, **3541**; alkaline phosphatase in neoplasms of the bitch, **3542**; demonstration and counting of mast cells in tissue section, **3544**.
See also Circulatory System, vessels; Encephalomyelitis, Mouse; Eperythrozoon; Fowl Paralysis and Avian Leucosis Complex; Leucosis.
Carcinoma. Of the lungs in man and animals, **512**; Schultz-Dale test for detection of specific antigen, **1335**; of the tonsils in a dog, **2022**; gastro-intestinal, in dogs, **2023**; pulmonary, in dogs, **2352**; **2353**; uterine, in cows, **2648**; bovine ocular squamous cell carcinoma, **2649**; adenomatosis and carcinoma in chronic pneumonia in g. pigs, **3218**; trauma and cancer in ducks, **3543**.
Chromaffinoma. Of the canine adrenal, **170**; of the bovine adrenal medulla, **3539**.
Glioma. Nature of glioma, **172**.
Granuloma. Vaginal, in cows, **636**.
Haemangiopericytoma. In the dog, **895**.
Mammary. High fat diet producing mammary fibroadenoma in rats, **2355**.
Mastocytoma. In dogs, **3865**.
Melanoma. In horses, donkeys and mules, **3217**.
Papilloma. See Papilloma.
Rous sarcoma. Intra-nasal infection in fowls, **513**; virus content in infected cells, **3875**.
Sarcoma. Femoral osteogenic sarcoma in a dog, **3863**; oesphageal sarcomata associated with Spirocerca lupi in dogs, **3866**.
NEORICKETTSIA. See Rickettsia Infection, general; dogs.
NEPHRITIS. See Kidneys.
NERVOUS SYSTEM.
General. Sympatheticotonic character of faecal extracts of cows, **1789**; in relation to heat loss in fine-wooled sheep, **1801**; anatomy of the autonomic n.s. in dogs, **2100**; book, neurological examination of the dog, **2468**.
See also Anaesthesia and Analgesia; Behaviour of Animals; Digestive System, ruminant digestion; Encephalomyelitis, Mouse; Immunology, general; Lactation.
Brain. Anterior pituitary-hypothalamic relations in ferrets, **606**; the hypothalamic nuclei during seasonal activity and broodiness in hens, **1018**; cytoarchitecture of the human brain stem, **1844**; utilization of glucose and non-utilization of acetate by the ovine brain, **2976**.
See also Distemper, Dog; Encephalomyelitis, Porcine; Laryngo-Enteritis, Feline Infectious; Mycobacterium Tuberculosis Infection, general; Neoplasms; Poisoning, organic.
Cerebrospinal fluid. Examination in dogs, **225**; comparison with aqueous humour in rabbits, **996**; biochemistry in dogs, **1387**.
Diseases. Data on mouse-spinning test, **475**; intracranial haemorrhage and blood-brain barrier in newborn babies, **574**; chronic dorso-lumbar neuritis in cattle, **1748**; osteomyelitis as cause of nervous disorders in poultry, **3933**; congenital malformations of the c.n.s. in pigs, **3981**.
See also Ataxia; Aujeszky's Disease; Bacterium Viscosum Equi; Borna Disease; Cuterebra; Digestive System, ruminant digestion; Distemper, Dog; Eosinophilic; Nematodiasis, Cerebrospinal; Neoplasms; logy, allergy; Leptospira Infection, horses; Liver, diseases; Myelitis, Infectious Feline; Myositis, Eosinophilic; Nematodiasis, Cerebrospinal; Neoplasms; Paralysis; Poisoning, inorganic; Rickettsia Infection, dogs; Setaria; Spastic Syndrome; Streptococcus Infection, swine; Swine Fever; Tick Paralysis.
Spinal cord. Degeneration with anterior paralysis in a pig, **2388**; spina bifida in zebu cattle, **2694**.
See also Setaria; Spinal Column.
NETHERLANDS. See Bronchitis, Avian Infectious; Duck Plague; Psittacosis; Reports.
NEWCASTLE DISEASE. See also Fowl Plague.
General. Rapid diagnosis, **118**; experimental research, **121**; effect of route of infection on susceptibility, **122**; experimental infection of pigs, **468-469**; course of infection as compared with fowl plague, **1273**; in zoo birds, **1644**; in man, **1652**; in partridges, **1980**; treatment, **1982**; serum proteins and vitamin content in fowls infected with Newcastle disease, coryza and fowl cholera, **2052**; geese as carriers, **2310**; strain pathogenic for g. pigs, **2312**; absence of inclusion bodies in human conjunctivitis, **2318**; epidemiology, **3168**; dyspnoea in exp. infection, **3169**; laboratory diagnosis in man, **3171**; report, Mauritius, **3999**.
Immunology. Interference phenomenon, **119**; interference of rinderpest virus in N.D. virus haemagglutination, **120**; vaccination in the U.S.A., **124**; vaccination of young chicks with Hertfordshire strain, **125**; vaccine in drinking water, **126**; **2313**; examination of blood of immunized fowls, **127**; efficiency of vaccination against airborne infection, **128**; choice of strains for vaccine preparation, **129**; rapid citrated whole-blood haemagglutination test, **466**; dialyzable factor in allantoic fluid inhibiting haemagglutination, **467**; vaccines and vaccination, **471-472**; **848**; serological diagnosis from organ extracts, yolk and blood clots, **846-847**; antigenic spectrum, **1274**; inactivation of egg-white haemagglutination inhibitor by virus, **1275**; vaccination of day-old chicks, **1276**; **2311**; effect of age on interference phenomenon, **1277**; antibiotics and production of h.i. antibodies, **1649**; post-vaccination reaction, **1650**; vaccination by the conjunctival route, **1651**; beta propiolactone vaccine, **1981**; **2315**; "incomplete" virus vaccine, **2314**; determination of safety of vaccines by i/c inoculation, **2316**; effect of dietary powdered tobacco on immunity, **2317**; c.f. and c.f.-inhibition test with fowl plague, Newcastle disease and swine influenza viruses, **2321**; h.i. test, **2620**; a whole blood h.i. test, **2900**; control in Bosnia by Mukteswar vaccine, **2902-2903**; production and evaluation of serum, **2904**; relationship between h.i. antibodies and immunity, **2906**; transmission of visceral lymphomatosis by live vaccines, **3170**; antibody formation and propagation of Newcastle disease and bovine influenza viruses in bovine mammary gland, **3177**; methods of administering B_1 vaccine, **3495**; killed vaccines, **3496**; wing-web vaccine, **3497**; flock history after use of combined Newcastle disease-infectious bronchitis dust vaccine, **3498**.
See also Newcastle Disease, virus.
Virus. Effect of various chemical agents, **123**; tissue culture, **135**; **1646**; effect on cells and interference with poliomyelitis virus in tissue culture, **470**; purification, **849**; haemolysin, **1645**; chick embryo culture, **1647**; cultivation in ascites cells, **1648**; non-infectious forms, **1987**; propagation in human embryonic lung, **2309**; study of a strain, **2621**; neuropathic effect on mice, **2622**; serological differentiation from equine virus abortion mumps and human and swine influenza, **2878**; teratogenic action on chick embryos, **2901**; effect of chick-embryo passage on Hertfordshire virus, **2905**; form of infection with attenuated virus, **3492**; attenuated strain, **3493**; electron microscopy, **3494**; isolation from man with confirmation by electron microscopy, **3499**; decrease in virus titre in de-embryonated eggs, **3816**.
See also Newcastle Disease, immunology.
NEW ZEALAND. See Dysentery, Vibrionic; Foot Rot; Heredity, general; Molybdenum; Mycobacterium Johnei Infection; Poisoning, plants; Reports; Salmonella Cholerae-Suis.
"NICARBAZIN." See Anthelmintics, for poultry, for swine; Eimeria Infection, avian.
NICOTINAMIDE. See Vitamins.
NICOTINIC ACID. See Vitamins.
ISO-**NICOTINIC ACID HYDRAZIDE.** See Isoniazid.
NIGERIA. See Eimeria Infection; Food Production; Insemination, Artificial; Pleuropneumonia, Bovine Contagious; Reports; Streptothrix.
NIGHTSHADE (Solanum spp). See Poisoning, plants.
NIPPOSTRONGYLUS. Electrophoresis of serum from rats immunized against N. muris, **160**; transmission of bacteria and skin penetration by N. brasiliensis larvae, **1322-1323**; migration and growth of N. muris in rats, **3210**.
NITRATES. Effect on snails, **152**.
See also Digestive System, ruminant digestion; Poisoning, plants.
NITRITES. Effect on snails, **152**.
See also Hygiene, food.
NITROFURAZONE. Determination in mixed feeds, **430**; evaluation, **1216**.
See also Eimeria Infection, avian; Poisoning, therapeutic substances; Salmonella Infection, swine.
NITROGEN. Metabolism of calcium, phosphorus and nitrogen in hypervitaminosis A in rats, **3235**.
NITROMIN. See Anaemia, Equine Infectious.
NITROPHENIDE. See Eimeria Infection, avian; Poisoning, therapeutic substances.
NOCARDIA. Generalized infection in a pig, **1200**; in a dog, **2831**.
"NOLVASAN." See Trichomonas Infection, cattle.
NOMENCLATURE. See Pleuro-Pneumonia Group; Staphylococcus Infection; Theileria Infection; Trichophyton; Viruses, General.
NORTHERN BORNEO. See Reports.
NORTHERN RHODESIA. See Reports; "Senkobo Skin Disease."
NOSE. See Respiratory System.
NOTOEDRES. See Mange.
NOVOBIOCIN. See Streptonivicin.
NUTRIA (MYOCASTOR COYPUS). See Liver, diseases; Streptococcus Infection, general.
NUTRITION.
General. Fat content of liver and kidney in pregnant ewes on various diets and during starvation, **191**; animal feeding problems in Europe, **515**; effect on reproduction

NUTRITION—General—[cont'd.]
in heifers, **519**; effect of different grades of hay and cod-liver oil on cattle, **523**; studies in poultry, **898**; discoloration of yolk and free gossypol, **899**; value of rapeseed meal, **902**; effect of cauliflower on ruminants, **903-905**; whole milk feeding problems, **1354**; condensed whale solubles for chicks, **1355**; effect of high and low plane on haematology in twin calves, **2658**; effect of overeating of fruit in cattle, **2660**; fecal chromic oxide conc. in cows in relation to feeding schedule, **2953**; effect of D.P.P.D., vitamin E and fish liver oil on turkey reproduction, **2958**; haemoglobin values and erythrocyte counts in pigs fed mineral supplements, **3233**; effect of the dam's ration on haematology in piglets, **3877**; book, nutrition of fowls, **4001**.
See also Blood, composition; Conferences and Congresses; Digestive System; Fleece; Manganese; Pastures and Grazing; Purines; Sex Hormones, oestrogens; Vitamins; Water; Wool; Yeasts; Zootechny.
Antibiotic supplements. See Books, nutrition; Growth, growth factors.
In relation to disease. Nutritional causes of anoestrus in cattle, **179**;. "curled tongue" in turkeys, **180**; effect of mite-infested bran on pigs, **182**; winter losses in pregnant cows and ewes fed low quality hay, **192**; undernutrition in new born g. pigs, **522**; nutritional cause of epileptiform fits in cattle, **910**; nutritional disorder following starvation, **1341**; effect of full and limited feeding on reproduction in gilts, **1342**; effect of alfalfa on ovulation rate in gilts, **1343**; mineral deficiency causing heart failure in mice, **1356**; glossitis in goslings, a deficiency, **1711**; effect of penicillin and vitamin B_{12} on debilitated horses, **2031**; posterior paralysis in pigs, probably a deficiency disease, **2359**; symposium on nutritional disorders in sheep, **2666**; ataxia (swayback) in lambs— a copper deficiency? **2675**; gangrene of the wings in chicks associated with diet, Cl. welchii type D and Staph. aureus, **2820**; maternal diet and dental caries in young rats, **3225**; abnormal haemolysis in exp. protein deficiency, **3555**; mineral deficiency in cattle, **3891**; in relation to bovine infertility, **3892**; grass silage as possible cause of ketosis, **3915**.
See also Anaemia, General; Bloat; Cannibalism; Cobalt; Colic; Copper; Encephalomalacia, Avian; Fusiformis Infection; Haemoglobinuria, Puerperal; Immunology, antibodies and antigens; Leucosis, bovine; Liver, diseases; Muscles; "Manchester Wasting Disease"; Mycobacterium Tuberculosis Infection, general; Osteomalacia; Parakeratosis; Perosis; Pica; Radiations; Salmonella Gallinarum Infection; Trace Elements; Vitamins; Wheat Pasture Poisoning.
NUTTALIA INFECTION. In horses, **3134**.
NYASALAND. See Actinomyces Congolensis; Reports.
NYMPHOMANIA. Hormone therapy, **295**; treatment and aetiology in cows and mares, **1038**; hereditary cystic ovaries associated with certain body conformation in cattle, **3035**.
NYSTATIN (FUNGICIDIN). See Fungicides; Histoplasma Capsulatum.

O

OCTACHLORONAPHTHALENE. See Vitamins, vitamin A.
OEDEMA, CONGENITAL. See Heredity, of disease.
"OEDEMA DISEASE" OF GOATS. See Agalactia, Contagious, of Sheep and Goats.
OEDEMA DISEASE OF PIGS. Experimental production and thiamine treatment, **560-562**; electrophoretic studies, **563**; in Poland, **1750**; and vibrionic dysentery, **1751**.
OESOPHAGOSTOMUM. Relationship with swine erysipelas and swine fever, **2641**; in French Equatorial Africa, **3523**.
OESTRIDAE.
Gastrophilus. G. pecorum as cause of equine stomatitis, **2926**.
Hypoderma. H. diana in Scottish reindeer, **145**; warble control by internal medication with phenothiazine and hexachloroethane, **146**; control with phosphorus compounds, **866**; migration of H. bovis larvae, **1305**; control, **1306**; **3187**; effect of NaCl on larvae, **1307**; control by oral phenothiazine, **1308**; pyrethrins for control of oviposition by H. lineatum, **1667**; control by rotenone sprays, **1668**; experimental s/c inj. of dieldrin, **2001**; treatment in Switzerland, **2002**; H. linatum and Wohlfahrtia magnifica in sheep and goats in Turkey, **2334**; prevention of skin perforation by derris preparations, **2629**; control in U.S.A., **3515**; movement of cattle in relation to warble season, **3834**.
Oestrus. Control in horses, **1309**; treatment in sheep, **2924**.
"OLDENBURG PIG DISEASE." See Gastro-Enteritis, Porcine Transmissible.
OMPHALITIS. See Navel.
ONCHOCERCA. Mosquito vectors, **1331**; incidence and pathology of microfilariae in the eyes of horses, **1685**.
ONIONS. See Poisoning, plants.
ONYCHOMYCOSIS. See Microsporum.
OPHTHALMIA, EQUINE PERIODIC. And leptospirosis, **1172**.
See also Onchocerca.
OPHTHALMIA, OVINE CONTAGIOUS. Chloramphenicol treatment, **1627**.
ORF. See Dermatitis, Contagious Pustular.
ORNITHODOROS. See Rickettsia Infection, Q fever.
ORNITHOSIS. See Psittacosis.
OSTEODYSTROPHY. See Bones.
OSTEOHAEMOCHROMATOSIS. See Bones.
OSTEOMALACIA. In young cattle, **2678**.
OSTEOMYELITIS. See Bones.
OSTEOMYELOSCLEROSIS. See Bones.
OSTERTAGIA. See Phenothiazine.
"OTRHOMIN." See Psittacosis-Lymphograuloma Group.
OXALIC ACID. See Pastures and Grazing; Poisoning, organic.
OXIDATION-REDUCTION POTENTIAL. See Muscles.
OXOPHENARSINE. See Trypanosoma Equiperdum.
OXYGEN. See Anaesthesia and Analgesia; Genital System, placenta.
OXYSTEROIDS. Effect on the inhibitory action of antibiotics on bacteria and E. histolytica, **2412**.
OXYTETRACYCLINE (TERRAMYCIN). A monograph, **4007**.
See also Corynebacterium Infection, cattle; Mastitis, Bovine; Milk and Milk Products; Pneumonia, Porcine Virus; Poisoning, therapeutic substances; Rickettsia Infection, dogs; Salmonella Pullorum Infection.
OXYTOCIN. See Lactation; Pituitary Gland.
OXYURIS. See Anthelmintics, for horses.

P

PAKISTAN. See Brucella Infection; Salmonella Pullorum Infection; Schistosoma.
PALUDRINE. See Theileria Infection.
PANAMA. See Trypanosoma Infection.
PANCREAS. Cobalt chloride and alpha cells, **209**; action of cobalt on islets of Langerhans, **920**; diseases in dogs, **2390**; atrophy in dogs, **2685**.
See also Glucagon; Hypoglycaemia; Staphylococcus Infection.
PANLEUKOPENIA, FELINE. See Enteritis, Mink.
PAPILLOMA. Serum-neutralization of bovine virus, **896**; immunization experiments, **2880**; in cattle, **3158**; vaccine, **3868**.
See also Neoplasms.
PARABIOSIS. See Immunology, general.
PARABRONEMA. Life-cycle of P. skrjabini of ruminants, **2946**.
PARAKERATOSIS. Effect of zinc on pigs, **201**; **2040**; factors affecting the condition in pigs, **2041**; mineral interrelationships in swine, **3894**.
PARALYSIS. Transmissible porcine paralysis in Denmark, **108**.
See also Encephalomyelitis, Porcine; Fowl Paralysis and Avian Leucosis Complex; Nervous System, spinal cord; Nutrition, in relation to disease; Poisoning, organic; Setaria; Streptococcus Infection, cattle; Tick Paralysis; Vitamins, vitamin E.
PARAMPHISTOMUM. P. hiberniae in the Channel Islands, **1319**; in sheep, **2340**.
See also Gigantocotyle.
PARASITICIDES.
General. Control of lungworms and arthropods by aerosols, **490**; response of insects and mammals to certain insecticides, **491**; automatic cattle sprayers, **870**; use of cyclethrin in sprays, **871**; potential parasiticides against A. americanum, **873**; recent advances, **1301**; prevention of body-strike in sheep by D.D.T., B.H.C., aldrin and dieldrin, **1302-1303**; for control of equine encephalomyelitis vectors, **1311**; D.D.T. and B.H.C. in veterinary practice, **1312**; for control of summer mastitis, **1515**; rotenone and pyrethrin-piperonyl butoxide sprays for warble control, **1667-1668**; creolin-B.H.C. mixture for sheep scab, **1672-1673**; insecticide-treated cords for fly control, **2335**; insecticides for control of livestock pests, **2628**; depletion of insecticides in contact with fleece, **3195**; resistance of houseflies to organic phosphorus insecticides, **3839**.
See also Anthelmintics; Lice; Malathion; Mange; Megninia; Oestridae, Hypoderma; Siphona; Stomoxys; Ticks.
Toxicity. Response of mammals to certain insecticides, **491**; toxicity of some hydrocarbon insecticides to earthworms, **2007**; D.D.T. residues in fat from steers on treated pastures, **2079**; effect on pigs of meal treated with D.D.T. and B.H.C., **3622**; of toxaphene, **3623**.
See also Hygiene, food; Poisoning, organic.
PARASITOLOGY. See Books; Technique.
PARATHION. See Poisoning, organic.
PARATHYROID GLANDS. Anatomy and histology in relation to calcium blood level in cattle, **3291**.
See also Ketosis.

PARESIS, PARTURIENT. See Milk Fever.
PAROTID GLANDS. See Salivary Glands.
PARTRIDGES. See Newcastle Disease.
PARTURITION. In bitches, **637-639**; **1041**; losses during pregnancy and parturition in ewes, **1439**.
See also Caesarian Section; Haemoglobinuria, Puerperal.
PASTEURELLA INFECTION.
General. Tetracycline therapy in cattle, swine and sheep, **357**; active immunization in farm animals, **1134**; virulence for mice and fowls of variants of 3 types of P. multocida, **2186**; immunizing value in relation to content of alkali-soluole toxic substances, **2187**; preparation of vaccine, in Egypt, **2188**; dihydrostreptomycin treatment, **2189**; lysogeny in P. multocida, **3373**; chronic infection in rabbits, **3698**.
Cattle. Vaccination against haemorrhagic septicaemia, **22**; shipping fever in Canada, **23**; **1865**; adjuvant vaccine, **356**; tetracycline treatment, **357**; studies on haemorrhagic septicaemia, **731-732**; intratracheal penicillin for calves, **1135**; immunity tests in vaccinated cattle, **1518**; "Past. romanica" isolated from endemic calf pneumonia in Roumania, **1520**; oil-adjuvant vaccine, **2507**; prophylaxis in cattle and buffaloes, **3372**.
Fowls. Chemotherapy of fowl cholera, **359**; P. gallinarum encountered in chronic fowl cholera, **1136**; serum proteins and vitamin content in fowls infected with Newcastle disease, coryza and fowl cholera, **2052**.
Sheep. Tetracycline treatment, **357**; fleece-shedding in ovine infectious mastitis, **1519**; ovine mastitis, **1866-1867**.
Swine. Tetracycline treatment, **357**; live vaccine for broncho-pneumonia, **358**.
See also Rhinitis, Porcine Atrophic.
PASTEURELLA MASTITIDIS. See Pasteurella Infection, sheep.
PASTEURELLA MULTOCIDA. See Pasteurella Infection, general.
PASTEURELLA PSEUDOTUBERCULOSIS INFECTION. Immunization of g. pigs, **24**.
"PASTEURELLA ROMANICA." See Pasteurella Infection, cattle.
PASTEURIZATION. See Eggs, Hen; Milk and Milk Products; Mycobacterium Tuberculosis.
PASTURES AND GRAZING. Palatability of herbage, **900**; estimation of faecal output in grazing cows, **901**; oxalate content of tropical grasses, **2030**; outdoor rearing of calves with reference to growth and grazing behaviour, **2128**.
See also Helminth Parasites, General; Mycobacterium Tuberculosis Infection, general.
PATERNITY. Abderhalden's defensive proteinase reaction, **629**.
PEAT. See Salmonella Infection, cattle.
PELVIS. See Bones, general.
PENICILLIN. For dogs, **982**; acquired resistance in g. pigs, **983**; distribution of labelled benzylpenicillin in the body, **1404**; nature of lethal action, **2408**; bacterial growth and antimicrobial effect, **3670-3671**.
See also Digestive System, fauna and flora; Growth, growth factors; Hygiene, food; Mastitis, Bovine; Nutrition, in relation to disease; Poisoning, therapeutic substances; Staphylococcus Infection; Trichocidin.
PENTACHLOROPHENOL. See Australorbis.
PENTAMIDINE. See Candida.
PERIARTERITIS NODOSA. In deer, **3924**.
PEROSIS. Effect of phosphorus, vitamin E and environment on growth and incidence in turkeys, **1721**; effect of floor type and choline in diet on incidence in chicks, **3232**; incidence in male turkeys, **3932**.
PETRELS. See Psittacosis.
PETROL. See Anthelmintics, for poultry.
PFEIFFERELLA ANATIPESTIFER INFECTION. A septicaemic disease of ducklings, **1125**; infectious serositis in ducks in Canada, **1126**; pathology, **2394**; transmission, **3885**.
PFEIFFERELLA MALLEI INFECTION. Conglutination test, **353**; evaluation of mallein by haemagglutination, **3690**; comparative studies of Malleomyces and Pseudomonas, **3691**.
PFEIFFERELLA WHITMORI INFECTION. In a pig, **1124**; isolation from soil and water, **2498**; resistance to antibiotics, **2499**; in pigs in Vietnam, **3089**; enhancement of virulence, **3365**; comparative studies of Malleomyces and Pseudomonas, **3691**.
PHALARIS. See Poisoning, plants.
PHARMACOLOGY AND MATERIA MEDICA, GENERAL. Recent advances in poultry therapeutics, **1776**.
See also Books.
PHEASANTS. See Calcium; Encephalomyelitis, Equine; Phosphorus; Salmonella Pullorum Infection.
PHENANTHRIDINIUM COMPOUNDS. See Babesia Infection, general.
PHENOTHIAZINE.
General. Effect on thyroid uptake of I^{131}, **248**; **3007**; **3265**; **For cattle.** For warble control, **146**; low level feeding, **891**; mixed with carob flour, **2344**; effect of low level feeding on O. ostertagi in faeces, **2642**.
See also Trichomonas Infection, cattle.
For dogs. In exp. Ancylostoma caninum infection, **2936**.
For horses. Poisoning in foals, **2080**; effect on radioiodine uptake by thyroid, **3007**.
For sheep and goats. Drenching in sheep, **169**; and ovine thyroid uptake of I^{131}, **248**; mixed with salt, for the control of Nematodirus and Haemonchus, **881**; effect on ovine blood-iodine values, **892**; and ovine conception rate, **893**; effect on cobalt-deficient lambs, **2366**; effect on ovine thyroid, **2411**; small doses against caprine trichostrongylosis, **2932**.
See also Haemonchus.
PHOSPHATASE. Properties of alkaline phosphatase from cows' milk and calf intestinal mucosa, **911**; **3224**; acid and alkaline phosphatases, diatase and lipase in ruminant serum, **1792-1793**.
PHOSPHORUS. Intestinal absorption and excretion in pigs, **1713**; uptake in sheep, **2037**; effect of sublethal doses on bone growth in rabbits, **2072**; phosphate transfer in the digestive tract of pigs and cattle, **2421-2422**; requirements of cattle, **2670**; deficiency in Kenya, **2671**; deficiency control in Northern Territory cattle, **2962**; measurements of transfer rates in rats, **2963**; metabolism of calcium, phosphorus and nitrogen in hypervitaminosis A in rats, **3235**; requirement of young pheasants, **3557**.
See also Blood, composition; Calcium, Digestive System, ruminant digestion; Hypoglycaemia; Oestridae, Hypoderma; Parasiticides; Perosis; Poisoning; Vitamins, vitamin E.
PHOTOSENSITIZATION. See Poisoning, plants.
PHYSICS. See Books.
PHYSOSTIGMINE. See Digestive System, ruminant digestion.
PICA. In cattle in Germany, **196**.
See also Cannibalism.
PIGEONS. See Anaemia, Equine Infectious; Anthelmintics; Encephalomyelitis, Equine; Erysipelothrix Rhusiopathiae Infection; Pleuro-Pneumonia Group; Pox Diseases; Psittacosis; Salmonella Infection, avian; Salmonella Typhi-Murium; Trichomonas Infection.
PIGLETS. See Swine.
PIGS. See Swine.
PIGMENTS. Nature of pigments from animals, **255**; book, chemical pathology of animal pigments, **325**; book, bile pigments, **1481**.
PINEAL GLAND. Hyperplasia in a mule, **1740**; monograph, **1843**; effect of pinealectomy on rat pituitary, **3020**.
PIPERAZINE COMPOUNDS. See Anthelmintics; Nematodiasis, Cerebrospinal.
PIROMEN. See Ketosis.
PIROPLASMOSIS. See Babesia Infection; Theileria Infection.
PITUITARY GLAND. Anterior pituitary-hypothalamic relations in ferrets, **606**; structure and function in cattle, **1020**; in chronic nephritis of dogs, **1386**; oxytocin and vasopressin distribution in the neurohypophysis of camels, **2431**; oxytocin stimulating anterior pituitary prolactin release, **2721**; effect of anterior growth hormone on pigs, **2956**; effect of pinealectomy on rat pituitary, **3020**; growth hormone as a metabolic hormone, **3021**; transbuccal hypophysectomy in dogs, **3329**; hypophysectomy in rats, **3995**.
See also Adrenocorticotrophic Hormone (A.C.T.H.); Lactation.
"PIVAL" (PIVALYL INDANDIONE). See Vermin Control.
PLASMINOGEN. Activators for prevention of post-operative adhesions in dogs, **1753**.
PLASMODIUM INFECTION. Experimental infection of rodents with Pl. berghei, **74**; susceptibility of Tunisian rodents, **75**; effect of splenectomy on infected mice, **807**; Pl. cathemerium infection in canaries, **1928**.
PLETHYSMOGRAPH. See Blood, pressure.
PLEURO-PNEUMONIA, BOVINE CONTAGIOUS. Diagnosis, **65**; immunity, **406**; preparation of antigen for rapid slide test, **780**; in Angola, **1577**; **3741**; in Nigeria, **1915**; **2559**; Willems phenomenon in cattle, following s/c inj. with infective material, **2232**; standardization of vaccines, **2233**; progress in Kenya, **2558**; vaccine, **2560**; nutrition of Asterococcus mycoides, **2834**; avianized strain, **3127**; in Australia, **3420**; **3740**; **3744**; c.f. test, **3421**; adjuvant action of certain substances on dried agent, **3422**; use of avianized vaccine in Portugal, **3742**; passage of organism in mice, **3743**; foetal infection, **3745**.
PLEURO-PNEUMONIA, CAPRINE CONTAGIOUS. Chick embryo culture, **407**; treatment, **1204**; in vitro effect of various chemotherapeutics, **1916**; in Kazakhstan, **2833**.
PLEURO-PNEUMONIA GROUP. Classification of Borrelomycetales, **1203**; ovine and caprine infection with P.P.L.O. in Sweden, **1205**; propagation of a caprine strain in chick embryos, **1206**; P.P.L.O. in poultry, **1209**; classification and nomenclature, **2235**; morphology studied by phase-contrast microscopy, **2236**; in vitro action of some antibacterial agents on an avian strain, **2237**; mild form of contagious pleuro-pneumonia in horses, **2378**; cultivation from ovine

PLEURO-PNEUMONIA GROUP—[cont'd.]
lung lesions, **2561**; growth-inhibiting effect of arsenicals and antibiotics, **2835**; isolation from pigeons, **3424**; effect of certain antibiotics and drugs on P.P.L.O. of avian origin, **3425**.
See also Rhinitis, Porcine Atrophic.
PNEUMOCOCCUS. See Streptococcus Infection, cattle.
PNEUMOCYSTIS. P. carinii infection in a dog, **3767**.
PNEUMONIA, GENERAL. Pneumo-enteritis in newborn calves, **2056-2058**; influenza, chronic pneumonia and diarrhoea in piglets, **2691**; control of chronic pneumonia in calves, **3733**; "chronic murine pneumonia," **3813**.
PNEUMONIA, CAPRINE VIRUS. Tetracycline treatment, **2294**.
PNEUMONIA, OVINE VIRUS. In lambs, **452**.
PNEUMONIA, PORCINE VIRUS. Treatment, **107**; effect on growth, and control, **456-459**; incidence in sows and bacon pigs, **1263**; tetracycline and oxytetracycline treatment, **1972**; **3163**; **3805**; in Morocco, **2303**; **3164**; **3481**; action of antibiotics and sulphadimidine, **2608**; histology of transmissible pneumonia with lymphoid hyperplasia, **3479**; lung lesions in Canada, **3480**.
PNEUMONITIS, FELINE. Action of tetracycline on infected chick embryos, **2898**; effect of antibiotics on Miyagawanella felis in chick embryos, **3811**.
PNEUMONITIS, MOUSE VIRUS. Evaluation of antibiotics and sulphonamides against psittacosis agents, **3814**.
See also Pneumonia, General.
POISONING.
General. By industrial fume deposits on pasture, **234**; **2398**; **2399**; effect of fungicidal seed dressing on laying hens, **238**; by toxic chemicals in agriculture, **967**; **2407**; chemical industry and air and water pollution, **1397**; in cattle by sawfly larvae, **1774**; toxicity of "sack cleanings" to pigs, **2406**; study on the toxicity of coal ash for cattle, **2662**; differential diagnosis from swine fever, **2702**; in domestic animals in Poland, **3256**; in sheep, **3257**; mechanism of toxic hepatic necrosis, **3258**; silo-filler's disease, **3936**.
See also Adrenal Gland, medullary hormones (adrenalin); "Doping"; Kidneys; Liver, diseases.
Inorganic. With arsenic in cattle, **232**; with arsenic in fowls, **233**; eosinophilic meningo-encephalitis in pigs, associated with NaCl poisoning, **566**; with arsenical plant sprays in cattle, **575**; bovine fluorosis in Tanganyika, **576**; lead poisoning in dogs, **577**; **3600-3601**; lead poisoning and fertility in mallards, **578**; with zinc chromate in calves, **579**; meat from arsenic-poisoned animals for human consumption, **613**; toxicity of arsenicals for lambs, **966**; removal of excess fluorine from water, **1395**; enhancement of sodium fluoride toxicity for rats by dietary fat, **1396**; by arsenic, and normal arsenious oxide content of hair and hooves of cattle, **1760**; fluorosis in Hyderabad-Deccan, **1761**; fluorine intoxication, **1762**; industrial fluorosis in Spanish cattle, **2069**; maternal transfer of fluorides to foetus, **2070**; calcium versenate treatment of acute lead poisoning in cattle, **2071**; with thallium in cats, **2073**; sodium chloride poisoning in turkeys, **2074**; treatment of sodium nitrite poisoning by exchange transfusion, **2075**; histopathology of bones in bovine fluorosis, **2400**; response of sheep to sublethal doses of fluoroacetate, **2402**; fluorine metabolism in domestic animals, **2703**; lead poisoning in cattle, **2997**; copper poisoning in sheep, **2998**; induced accumulation of citrate in treatment of lead poisoning, **3602**; nitrite poisoning from meat, **3633**; toxicity of isopropyl phenylcarbamate-treated potato residues, **3882**.
See also Fungicides; Liver, diseases; Molybdenum; Phosphorus; Sodium Copper Chlorophyllin.
Organic. In puppies with anticoagulant rodenticides, **237**; toxicity of oxalic acid for sheep, **316**; with dinitrocresol in pigs, **584**; toxicity of parathion, **585**; toxicity of malathion, chlorthion, aldrin and dieldrin, **586-588**; paralysis in fowls from organo-phosphorus compound, **968**; with parathion in cattle, **969**; with B.H.C. in horses, **970**; warfarin poisoning in pigs, **971-973**; toxic liver dystrophy in pigs from tar slabs, **975**; effect of wheat fumigated with methyl bromide, **976**; haemolytic anaemia and capillary fragility in D.D.T. poisoning, **1401**; diagnosis of dinitro-ortho-cresol poisoning in cattle, **1764**; diagnosis of poisoning with organic phosphorus insecticides, **1765**; liver, kidney, spleen and lymph node lesions in cats poisoned with trichlorethylene, **1766**; examination of material from animals poisoned by contact insecticides, **2078**; hazards pertaining to the use of insecticides, **2632**; with urea in cattle, **2705**; brain cholinesterase in animals poisoned with parathion, **2713**; suspected B.H.C. poisoning in cattle, **3006**; toxicity of captan-treated corn for pigs and fowls, **3551**; chlorinated naphthalene poisoning in cattle and stomatitis, **3604**; with chlorinated napthalene-impregnated binder twine in cattle, **3605-3609**; aplastic anaemia in cattle, horses and sheep, produced by trichloroethylene-extracted feeds, and observations in exp. animals, **3610-3616**.
See also Hyperkeratosis; Parasiticides, toxicity; Phenothiazine; Venoms.
Plants. Mercurialis annua poisoning in horses, **239**; aetiology of photosensitization in lambs, **240**; book, poisonous plants of India, **326**; book, British poisonous plants, **581**; bracken, **582**; **1399**; **2709**; with Arum maculatum in cattle, **583**; dissecting aneurysms in turkeys, **960-961**; with Claviceps paspali in cattle in Israel, **977**; with lucerne in horses, **978**; toxicity of Indigofera endecaphylla, **979**; acute Senecio jacobaea poisoning in cattle, **980**; effect of ergot on pregnancy and lactation in rats, **1398**; by moulds, **1768**; poisonous plants of Texas, **1769**; lupin poisoning in pigs, **1770**; is liver cirrhosis in horses senecio poisoning? **1771**; with Trifolium hybridum, **1772**; prevention of facial eczema, **1773**; **2405**; immune serum against ricin poisoning, **2077**; with Claviceps paspali in Portuguese cattle, **2403**; acorn poisoning in sheep, **2404**; nitrate hazard in mangolds, **2704**; with ergot in domestic animals, **2707**; oestrogenic inhibition of foetal resorption in lathyrism, **2708**; nightshade poisoning, **2710**; with Ranunculus spp. in sheep, **2711**; causing bovine haematuria, **2712**; suspected fodder-beet poisoning in pigs, **2955**; prussic acid poisoning on pastures, **3000**; toxicity of introduced leguminous plants in the Belgian Congo, **3001**; nigro-pallidal encephalomalacia (chewing disease) in horses caused by yellow star thistle, Centaurea solstitialis, **3002**; by Acacia georginae in cattle and sheep, **3003**; dissecting aneurysm produced by Lathyrus odoratus meal in rats, **3004**; photosensitization studies in New Zealand, **3005**; toxicity of Atalaya hemiglauca (whitewood) for horses, **3260**; fescue lameness in cattle, **3261**; **3262**; with Kalmia angustifolia (laurel) in sheep, **3263**; failure to poison fowls with Senecio squalidus, **3264**; onion poisoning in cattle, **3619**; Phalaris staggers in sheep, **3620**; with Heliotropium europaeum, in sheep, **3621**; with Dendrochium toxicum in horses, **3939**; ragwort poisoning from silage, **3940**; book, toxic plants of Western Australia, **4006**.
See also Fungi, General; Haemorrhagic Syndrome, Fowls; Rape; Wheat Pasture Poisoning.
Therapeutic substances. Toxicity of nitrophenide for dogs, **242**; nitrofurazone poisoning in chicks, **243**; toxicity of rauwolfia for dogs, **244**; effect of protein on toxicity of hexachloronaphthalene, **245**; toxicity of penicillin for g. pigs, **591**; **2408**; toxicity of aureomycin for g. pigs, **592**; penicillin poisoning in piglets, **1400**; by sulphaquinoxaline in fowls, **1775**; drug-induced anaemia in fowls, **1779**; toxicity to hamsters of oral aureomycin, tetracycline and terramycin, **2082**; toxicity of penicillin for hamsters, **2409**; in man with bread containing endrin, **3937**; toxicity for livestock of some agricultural chemicals, **3941**; **3942**.
See also Anaesthesia and Analgesia; Phenothiazine, for horses; Poisoning, organic.
POLAND. See Brucella Infection, general; Clostridium Infection, sheep; Cystocaulus; Erysipelothrix Rhusiopathiae Infection; Man, Diseases of Animals Transmissible to and from; Oedema Disease of Pigs; Poisoning, general; Trichomonas Infection.
POLIOMYELITIS. Neutralizing antibody in animal sera, **1958**; antiviral activity of helenine, **3506**.
See also Newcastle Disease, immunology.
POLYSEROSITIS, PORCINE INFECTIOUS. Caused by a P.P.L.O., **411-412**.
POLYSPERMY. See Semen and Spermatozoa, general.
POLYVINYLPYRROLIDONE. See Immunology, complement fixation; Viruses, General.
PORPHYRIA. Hereditary, in swine and cattle, **1044**; congenital, in swine, **3982**.
See also Bones, diseases.
PORPHYRINS. Biological and chemical importance, **1078**;
PORTUGAL. See Aujeszky's Disease; Blood, composition; Pleuro-Pneumonia, Bovine Contagious; Poisoning, plants.
POTASSIUM. Effect of induced hypocalcaemia on toxicity, **1362**; effect of Na+ depletion on Na+ : K+ ratio in paratid saliva of sheep, **2724**; combined action of potassium and histamine, **3279**.
See also Blood, composition; Circulatory System, heart; Embryos, Mammalian and Foetuses; Hypoglycaemia.
POTASSIUM CHLORIDE. See Semen and Spermatozoa, general.
POTASSIUM PERMANGANATE. See Ketosis.
POULTRY. See Ducks; Fowls; Geese; Pigeons; Turkeys.
POX DISEASES.
Cow pox and vaccinia. Tissue culture of vaccinia virus, **135**; thiobarbitone anaesthesia in calves used for vaccine production, **445**; relationship of cow pox with milker's nodules, **821**; individualities of fowls in haemagglutination of vaccinia virus, **2596**; pox-like disease in cattle

POX DISEASES—Cow pox and vaccinia—[cont'd.]
from milker's nodules, **2597**; transmission from man to cows, **2865**; haemagglutination, **3454**.
Fowl pox and diphtheria. Vaccines, **822**; **3776-3778**; report, East Africa, **1988**; evaluation of immunity, **3457**.
Mouse pox (Ectromelia). In laboratory mice, **3590**.
Pigeon pox. New method of applying vaccine, **3458**.
Sheep pox. Aluminium hydroxide vaccine, **1612**; abortion in sheep from contaminated vaccine, **2598**; propagation in tissue culture, **3455**.
Smallpox. See Pox Diseases, cow pox and vaccinia.
PREDNISONE. See Adrenal Gland, cortical hormones.
PREGNANCY.
General. Proof of previous pregnancy in cow and sow, **290**; vaginal cytology in pregnant cows, **1033**; losses during pregnancy and parturition in ewes, **1439**; absence of cotyledons in a pregnant cow, **2120**; renal function in pregnant ewes, **2375**; effect on wool growth, **2747**; relation of foetal sex and length of gestation, **3013**; collagen content of foetal membranes and uterus in pregnant and postparturient rats, **3311-3313**; transactions of conference on gestation, **3339**.
See also Bluetongue; Bones, general; Encephalitis, Japanese; Genital System, uterus; Mycobacterium Tuberculosis Infection, tuberculin test; Nutrition, general; Poisoning, plants; Pteroylglutamic Acid; Sex Hormones, general; Urinary System, general.
Diagnosis. Legal aspects of rectal examination in cows, **288**; in cows by injection of colostrum, **289**; spermine in the blood of pregnant cows, **630**; use of gonadotrophins, **1034**; merits of some male toads and frogs, **2121**; use in mares of the Galli-Mainini and the Aschheim-Zondek tests, **2442**; by radiography, in bitches, **3310**.
PREGNANCY TOXAEMIA. High level of blood oestrogen, **213**; prophylaxis and treatment on flock basis, **1366**; in C.S.I.R.O. report, Australia, **1472**; glycerol and glucose therapy, **1732**; prevention, **2374**; renal function in pregnant, normal and affected ewes, **2375**; correlation between hypoglycaemia and induction of symptoms, **3580**.
PROBSTMAYRIA. Study of the genus, **890**.
PROCAINE. See Anaesthesia and Analgesia; Mastitis, treatment.
PROGESTERONE. See Sex Hormones.
PROLACTIN. See Pituitary Gland.
PROPERDIN. See Immunology, general.
PROPIONATE. See Blood, composition.
PROSTATE GLAND. See Genital System.
PROTEIN. Serological differentiation of heated animal proteins, **3295**.
See also Blood, composition; Electrophoresis; Growth, growth factors; Nutrition; Yeasts.
PROTEINASE. See Paternity.
PROTHROMBIN. See Blood, coagulation.
PROTOZOA, GENERAL. Ascites and hepatosplenomegaly in mice associated with a protozoan, **3442**.
See also Anaplasma Infection; Babesia Infection; Books; Eimeria Infection; Eperythrozoon; Giardia; Haematuria, Bovine Chronic; Histomonas Meleagridis Infection; Isospora Infection; Leishmania Infection; Nuttalia Infection; Pneumocystis; Sarcosporidia; Theileria Infection; Toxoplasma Infection; Trichomonas Infection; Trypanosoma Infection.
PRUSSIC ACID. See Poisoning, plants.
PSEUDOMONAS. Ps. pyocyanea as cause of reproductive disorders in cattle, **25**; mastitis in cattle, **1137**; **2190**; **3699**; control in artificial insemination bulls, **1138**; staining of wool, **2508**; experimental pyelonephritis by various bacteria, **2547**; comparative studies of Malleomyces and Pseudomonas, **3691**; septicaemia in puppies, **3700**.
See also Ketosis.
PSITTACOSIS. Serological reaction in domestic animals to antigens, **132**; **1986**; reproduction of virus, **473**; pigeons as source of human infection, **474**; in Germany, **852**; in turkeys, **853-854**; **3173**; in man and pigeons in the Netherlands, **855**; complement-fixing antigens, **1653-1654**; latent infection of chick-embryo tissue, **1985**; in pigeons, **2322**; persistence of antibodies in infected pigeons, **2623**; in the petrel, Puffinus temuirostris, **3504**; budgerigars, **3819**.
See also Acridines.
PSITTACOSIS-LYMPHOGRANULOMA GROUP. A possible cause of disease in man, domestic and wild animals in the Belgian Congo, **133**; **1287**; pathogenicity for man of bovine broncho-pneumonia agent, **1660-1661**; serological reaction to antigens in domestic animals, **1986**; Miyagawanella bovis in cattle imported to Japan from the U.S.A., **2323**; bovine pneumonia caused by Miyagawanella, **2324**; **3175**; isolation of Miyagawanella from bovine faeces, **3176**; "neorickettsial" infections, **2624**; infection in animals, **2907**; antibodies in serum of cattle in Italy, **2908**; antigenic studies, **2909**; otrhomin treatment of infectious bronchitis and broncho-pneumonia in cattle, **3157**; as cause of abortion in cattle, **3174**; antigenic studies, **3505**.
See also Pneumonitis, Feline; Pneumonitis, Mouse Virus.
PSORERGATES. Control of the itch mite in sheep, **2005**; murine ear mange—P. simplex infestation, **2006**; nidification of P. simplex in murine skin, **2929**.
PSOROPTES. See Mange, general; cattle.
PSYCHOLOGY. See Behaviour of Animals.
PTEROYLGLUTAMIC ACID (FOLIC ACID). See Vitamins, vitamin B (folic acid).
PUBLIC HEALTH. Animal-human health relationships, **3960**.
See also Ascaris; Cysticercus; Hygiene; Man, Diseases of Animals Transmissible to and from; Milk and Milk Products; Taenia; Trichinella.
PUERTO RICO. See Schistosoma.
PULLET DISEASE. Study of the ovaries in "avian infectious diarrhoea," **1390**; treatment with dietary aureomycin, **2062**; genetic variation in resistance, **2063**; transmission of a disease resembling blue-comb disease, **2392**; in poults, **3595** **3596**.
PUPPIES. See Dogs.
PURINES. Abnormal purine metabolism in cattle, **2667**.
PYRETHRIN. See Parasiticides.
PYREXIN. Its relation to bacterial pyrogens, **2067**.
PYRIMETHAMINE. See Eimeria Infection, general.
PYRUVATE. See Blood, composition.

Q

Q FEVER. See Rickettsia Infection.
QUATERNARY AMMONIUM COMPOUNDS. See Growth, growth factors; Mycobacterium Tuberculosis Infection, general.
QUINACRINE. See Theileria Infection.

R

RABBITS. See Blood, groups; Circulatory System, heart; Eimeria Infection, general; Erythroblastosis; Fasciola; Mange, psoroptic; Myxomatosis; Pasteurella Infection, general; Semen and Spermatozoa; Spirochaeta Infection; Toxoplasma Infection; Trypanosoma Infection, general.
RABIES.
General. In Malaya, **86**; **3450-3451**; transmitted by bats in Surinam cattle, **87**; in bats, **88**, **1228**; **1951**; electrophoresis in diagnosis, **444**; in wild life in Texas, **818**; action of A.C.T.H., **820**; recurrent form in a rabbit, **1234**; features in French West Africa, **1610**; maternal transmission of street virus to offspring via the milk, in hamsters, **1611**; transmission from bat to ticks, **1953** control in Germany, **2268**; foxes as transmitters, **2591**; exp. infection in bats, **2592**; in a research worker, **2595**; control in the U.S.A., **3150**; derriengue problem in Mexico, **3151**.
Immunology. Post-exposure vaccination, **89**; diagnosis and vaccination, **819**; in cattle, **1229-1232**; **1952**; avianized vaccine, **1233**; **1952**; **2863**; **3453**; immunization of dogs, **1954** c.f. test, **2269**; **2270**; standardization of antiserum, **271**; Habel test for vaccines, **2272**; dried formol vaccine, **2594**; reaction of cattle to vaccination with chick embryo attenuated strain, **2862**; conglutination test, **3452**; immunity to challenge and antibody response in mice, as affected by dosage of vaccine, **3774**; antibody response in unexposed man, following various schedules of serum-vaccine dosage, **3775**.
Virus. Electron microscopy, **1235**; tissue culture, **1955**; action of hormones and sodium nucleate on virus, **2593**; in vitro cultivation of street virus, **2864**; isolation from insectivorous bats in Yugoslavia, **3773**.
RACCOONS. See Distemper, Dog.
RADIATIONS. Whole body cobalt-60 gamma irradiation of asses and pigs, **230**; retinal burns from atomic bombs, **231**; radiation damage to livestock, **568**; haematological response of asses to total body tantalum-182 irradiation, **569**; effect on pigs of total body gamma radiation, **570**; bacterial permeation of the gut wall in irradiated asses, **775**; beta irradiation in veterinary ophthalmology, **962**; whole body gamma irradiation of donkeys, **963**; repetitive exposure to gamma rays and blood formation in rats, **964**; books, radiation biology, **1076-1077**; **1839**; lethal effect on rats, **1393**; effects of periodic exposure to X-rays, **1755**; effect of atomic explosions on animals, **1828**; response in asses to 100 r fractional whole body gamma irradiation, **2068**; contamination of food by radioactive substances, **2102**; effect of X-rays on avian reproduction, **2132**; action on living cells, **2137**; virus inactivation by gamma irradiation, **2326**; food and water consumption in rats during exposure to gamma irradiation, **2396**; plasma factor for stimulation of erythropoiesis in irradiated rats, **2397**; action of ionizing radiation on biological materials, **2432**; radiation injury and erythrocyte sedimentation in dogs, **2995**; effect of feeding Bikini ash to chicks, **2996**; radiation syndrome in adult fowls, **3253**;

RADIATIONS—[cont'd.]
effect of atomic fall-out on animals and food, **3296**; genetic effects of atomic radiation, **3984**; radioassay, **3996**.
See also Choriomeningitis, Lymphocytic Murine; Trichinella.
RADIOLOGY. See X-Rays.
RAILLIETINA. See Anthelmintics, for poultry.
RANUNCULUS. See Poisoning, plants.
RAPE. Rape pasture as the cause of fatal haemorrhage in fowls, **517**.
"RATIN" (SALMONELLA ENTERITIDIS VAR. DANYSZ). See Salmonella Infection, general.
"RATININ" (A RED SQUILL RAT POISON). See Vermin Control.
RAUWOLFIA. See Genital System, oestrous cycle; Poisoning, plants.
RED SQUILL. See Vermin Control.
REINDEER. Hypoderma diana and Lipoptena cervi in Scottish reindeer, **145**.
REPORTS.
Algeria. Pasteur Institute (1954), **670**.
Australia. Institute of Medical and Veterinary Research, South Australia (1952-53), **316**; C.S.I.R.O. (1954), **1472**; Western Australia Dept. of Agric. (1954), **1832**; Institute of Inspectors of Stock Yearbook, New South Wales (1955), **2143**.
Bechuanaland. Dept. Vet. Services (1953), **665**; Vet. Dept. (1954), **2148**.
Belgium. Institute for Scientific Research in Central Africa (1952), **320**; Committee for control of sterility, Vet. College, Ghent (1955), **3976**.
Bermuda. Dept. of Agriculture (1953), **317**.
Cyprus. Chief Vet. Officer (1955), **3331**.
East Africa. East African Tsetse and Trypanosomiasis Research and Reclamation Organization (1954-55), **1582**; East African Virus Research Institute (1954-1955), **1988**.
See also Reports, Kenya; Tanganyika; Uganda; Zanzibar.
Fiji. Senior Vet. Officer, Dept. of Agriculture (1955). **3333**.
Gambia. Dept. Vet. Services (1952, 1953), **666-667**.
Gold Coast. Dept. of Animal Health (1953-54), **2145**.
Grenada. Agricultural Dept. (1953), **318**.
India. Vet. Research Institute Mukteswar and Izatnagar, (1942-46, 1946-47, 1949-50, 1952-53), **662**; **1068**; **3652**; **3653**.
See also Reports, international.
International. U.N. Report to the Government of India on artificial insemination and sexual control in cattle (1955), **276**; F.A.O. Meeting on livestock production (Buenos Aires, 1955), **669**; U.N. Meeting on international regulations on import and export of semen (Cambridge, 1955), **2437**; Interafrican Bureau of Epizootic Diseases (1955), **3332**; U.N. Report to the Government of India on manufacture of biologics (1955), **3335**.
See also Foot and Mouth Disease, immunology.
Ireland, Republic of. Minister of Agriculture (1954-55), **3654**.
Jamaica. Dept. of Agriculture (1954), **3655**.
Kenya. Dept. Vet. Services, (1954), **1833**.
See also Reports, East Africa.
Malaya. Vet. Dept. (1954), **1836**.
Mauritius. Dept. of Agriculture (1954), **3999**.
Netherlands. Animal Health Service, South Holland (1953-54), **321**; Director of the Netherlands Veterinary Service (1951-53), **2466**.
New Zealand. Committee on Vet. Education (1955), **2104**; Canterbury Agricultural College (1955), **2155**; Director-General of Agriculture (1955), **2753**.
Nigeria. West African Institute for Trypanosomiasis Research (1954), (1955), **416**; **3427**; Vet. Dept. Northern Region, (1953-54), **1834**.
Northern Borneo. Dept. of Agriculture, (1954), **1837**.
Nyasaland. Vet. Dept. (1954), **2149**.
See also Reports, Rhodesia. (For Reports of the Federation of Rhodesia and Nyasaland).
Rhodesia. Dept. of Vet. Services, Northern Rhodesia (1954, 1955), **661**; **3998**; Director of Vet. Services, Southern Rhodesia (1953), **1473**; Director of Tsetse Fly Operations (1954), **2003**; Secretary to the Federal Ministry of Agriculture, Rhodesia and Nyasaland Federation (1954), **2755**; Commission of Inquiry on Human and Animal Trypanosomiasis in Southern Rhodesia (1955), **3130**.
Sarawak. Dept. of Agriculture (1954), **663**.
Sierra Leone. Vet. Department (1954, 1955), **2146**; **3656**.
Somaliland. Dept. of Agric. and Vet. Services (1955), **3334**.
Tanganyika. Vet. Department (1954), **668**; **3044**.
See also Reports, East Africa.
Trinidad and Tobago. Director of Agriculture (1953, 1954), **664**; **2147**.
Uganda. Dept. Vet. Services and Animal Industry, (1954), **1835**.
See also Reports, East Africa.
Union of South Africa. Johannesburg Abattoir and Livestock Dept. (1953-54), (1954-55), **660**; **2754**; Vet. Services (1956), **3330**; South African Institute of Medical Research (1955), **3651**.
Union of Soviet Socialist Republics. Scientific session of the All-Union Society of Helminthologists (1956), **2950**.
United Kingdom. Medical Research Council (1953-54), **314**; Ministry of Health, Part II (1953), **315**; London School of Hygiene and Tropical Medicine (1953-54), **657**; U.F.A.W. (1953-54), **658**; Hillsborough Agric. Research Institute, Northern Ireland (1953-54 and 1954-55), **659** and **1831**; Min. of Agriculture, Fisheries and Food, Animal Health Services, Diseases of Animals Act (1954), **1830**; Colonial Office. Tsetse fly and trypanosomiasis committee report (1954-55), **1924**; Royal Veterinary College (1953-54 and 1954-55), **2139** and **3043**; Committee for Colonial Agriculture, Animal Health and Forestry Research (1953-54 and 1954-55), **2140** and **2141**; Colonial Medical Research Committee (1954-55), **2142**; Veterinary Research Division, Northern Ireland (1952-53), **2752**; West of Scotland Agricultural College (1955), **3650**; Foot and Mouth Disease Research Institute, Pirbright (1954-55), **3768**; National Institute for Research in Dairying (1955), **3995**.
See also Vitamins, vitamin B_{12}.
United States of America. Livestock Conservation, Inc. (1950-51), **322**; Representative on the advisory committee to Secretary Benson on vesicular exanthema, **836**; Salmonella pullorum antigen committee, **1149**; Committee on infectious diseases of cattle, **1376**; Regional Poultry Research Laboratory, East Lansing, Michigan, (1951-54), **2952**.
Yugoslavia. Outpatients' department, Zagreb Veterinary Faculty (1954-55), **2435**.
Zanzibar. Dept. of Agriculture (1954), **319**.
See also Reports, East Africa.
RESEARCH INSTITUTES. Agricultural research station, Nungua, Gold Coast, **615**; inauguration of the Federal Laboratory of Animal Husbandry, Dakar, **897**; the vet. research station at Salekhardsk, northern Omsk Oblast, **1427**; C.S.I.R.O. poultry research centre, **3301**.
See also Reports.
RESPIRATORY SYSTEM.
General. Air volume respired by cattle, **252**; sorptive properties of the olfactory membrane, **2083**; effect of electric stimulation on respiration in dogs, **2097**.
See also Barking; Temperature.
Lungs. Function in health and disease, **573**; ovine pulmonary disease in the U.S.S.R., **1380**; suppurative pneumonia and pleurisy in sheep and lambs, **1749**; experimental aspiration pneumonia, **1757**; pneumotropic virus infections in pigs, **2892**.
See also Emphysema; Immunology, allergy and anaphylaxis; Neoplasms; Pleuro-Pneumonia Group.
Diseases. Overheating as cause of disease in lambs, **2383**; infectious catarrh of upper tract in horses, **2984**.
See also Actinomyces Actinoides; Aspergillus; Bacterium Viscosum Equi; Bronchitis, Avian; Chronic Respiratory Disease; Coryza, Avian; Echinococcus; Emphysema; Epidemic Cough; Laryngo-Enteritis, Feline Infectious; Laryngotracheitis, Avian Infectious; Neoplasms; Pasteurella Infection, cattle; swine; Pleuro-Pneumonia; Pneumocystis; Pneumonia; Pneumonitis, Feline; Psittacosis-Lymphogranuloma Group; Respiratory System, lungs; Rhinitis, Porcine Atrophic; Rhinotracheitis, Infectious Bovine; Salmonella Infection, general; Sinusitis, Infectious, of Turkeys; Spirocerca; Temperature, environmental; Trichosomoides; Yeasts.
RHINITIS, GENERAL. "Inclusion body" rhinitis in young piglets, **565**.
RHINITIS, PORCINE ATROPHIC. Experiments in rabbits with Past. septica, **223**; control, **564**; in France, **950**; cat as carrier, **951**; presence in serum of Past. multocida antibodies, **952**; aetiology, **1381**; search for means of control, **1382**; isolation of a rickettsia from aborted foetuses and piglets of affected dams, **1993**; associated with a P.P.L.O., **2234**; establishment of a free herd, **2385**; pathogenesis, **2386**; and import of pigs to South Africa from Canada, U.S.A. and Europe, including the U.K., **3586**; in pigs other than Landrace, **3927**.
RHINOESTRUS. See Oestridae, Oestrus.
RHINOTRACHEITIS, INFECTIOUS BOVINE. In Colorado, **221**; cattle disease entities new to California, **1248**; treatment with pancreatic dornase, **2289**; treatment, **2602**; experimental transmission, **2879**; **3470**; recent developments, **3469**.
RHIPICEPHALUS. See Babesia Infection, general; Theileria Infection; Ticks, Ixodidae.
RHIZOPUS. R. equinus and Aspergillus fumigatus from aborted bovine foetuses, **2231**.
RHODESIA. See Babesia Infection, swine; Glossina; Reports; Trypanosoma Infection, general.
RIBOFLAVIN. See Vitamins.
RICKETS. See Vitamins, vitamin D.

RICKETTSIA INFECTION.
General. An unidentified agent of disease in man, domestic and wild animals in the Belgian Congo, **133**; **1287**; resistance of mice with histoplasmosis to R. typhi, **139**; strains recovered from ticks in Mississippi Gulf Coast, **1291**; varieties, **1659**; "neorickettsial" infections, **2624**; resistance to subsequent bact. infection after exp. rickettsial infection, **3182**.
See also Immunology, complement and complement fixation.
Cattle. Tick-borne fever in cattle, **944**; **2287**; aetiology of bovine infectious keratoconjunctivitis, **2327**.
See also Rickettsia Infection, Q fever.
Dogs. Terramycin and magnamycin treatment of Neorickettsia helminthoeca infection (Salmon disease), **136**; diagnosis of "salmon poisoning," **481**; a strain from a dog with encephalitis, **1290**.
Q fever. Excretion of R. burneti and carriers, **480**; in Britain, **858-859**; role of Ornithodoros, **860**; in Bulgaria, **1289**; geographical distribution, **1655**; spread from animals to man, **1656**; serology in Belgium, **1657**; c.f. test, **1658**; in Wales, **1992**; in the U.S.S.R., **2913**; preparation of antigen, **2914**; antibodies in slaughter sheep and cattle in Italy, **3181**; in Lebanon, **3507**; a killed vaccine, **3820**; growth in monolayer cultures of chick cells, **3821**.
Sheep. Effect of tick-borne fever on the resistance of lambs to staphylococci, **3520**.
See also Rickettsia Infection, Q fever.
Swine. Presence in aborted foetuses and piglets from sows with atrophic rhinitis, **1993**.
RIFT VALLEY FEVER. Factor inactivating virus, **1251**; report, East African Virus Research Institute, **1988**; resistance to infection produced in mice by s/c inj. of virus irradiated with u.v. light, **2292**; study in mice, **3160**; in Kenya, **3473**; coagulation defect in Rift Valley and yellow fever, **3474**.
See also Acridines.
RIGOR MORTIS. See Muscles.
RINDERPEST. Fixation of lapinized virus in rabbits, **94**; virus preservation by freeze-drying, **95**; post-vaccination reactions in cattle, **96**; interference with Newcastle disease virus haemagglutination, **120**; inactivated tissue vaccines, **450**; goat tissue vaccine, **827**; scarification versus s/c vaccination in sheep and goats, **828**; immunization methods, **1244**; lapinized virus, **1245**; **1963**; **3787**; haematology in cattle following infection with avianized virus, **1246**; skin lesions associated with streptothricosis, **1623**; lapinized virus for buffaloes, **1624**; tissue culture, **2282**; neutralization in chick embryos, **2283**; demonstration of C.F. antigen in chick embryos, **2284**; changes of avianized-lapinized virus after renewed rabbit passage, **2285**; infection of pigs with L. and L.A. strains, **2286**; salmonellosis in rabbits resembling rinderpest, **3100**; influence of virus strain and host species on lesions, **3784**; cellular inclusion bodies, haematology and histology, **3785**; variability of virus, **3786**.
RING TEST. See Brucella Infection; Salmonella Pullorum Infection.
RINGWORM. See Microsporum; Trichophyton.
RODENTICIDES. See Poisoning, general; Vermin Control.
ROTENONE. See Parasiticides.
ROUMANIA. See Erysipelothrix Rhusiopathiae Infection; Mycobacterium Tuberculosis; Pasteurella Infection, cattle.
ROUND HEART DISEASE. Role of zinc, **1391**.
ROUS SARCOMA. See Neoplasms.
RUBARTH'S DISEASE. See Hepatitis, Canine Virus.
RYEGRASS. See Magnesium.

S

SALICYLAMIDE DERIVATIVES. See Fungicides.
SALIVARY GLANDS. Virus disease in chimpanzees, **465**; parotid secretion in sheep, **2417**; excretory ducts of mandibular and sublingual glands in dogs, **3955**.
See also Aureomycin; Cauliflower; Sodium.
"SALMON POISONING." See Rickettsia Infection, dogs.
SALMONELLA ABORTUS-EQUI INFECTION. Vaccine, **1871**; in horses, **2789**.
SALMONELLA ABORTUS-OVIS INFECTION. In sheep, **739**; possible cause of human abortion, **3099**.
SALMONELLA ANATUM. See Salmonella Infection, avian.
SALMONELLA ARIZONA. Occurrence and distribution in man and animals, **3702**.
SALMONELLA BAREILLY. See Salmonella Infection, horses.
SALMONELLA BOVIS-MORBIFICANS. See Salmonella Group; Salmonella Infection, cattle.
SALMONELLA BRAENDERUP. See Salmonella Infection, general.
SALMONELLA CHOLERAE-SUIS. Bacteriophage typing, **1146**; isolated from cattle in New Zealand, **1524**; serotypes in Slovakia, **2790**; in pigs treated with aureomycin supplement, **3706**.
SALMONELLA ENTERITIDIS. See Salmonella Infection, general; cattle; Vermin Control.
SALMONELLA GALLINARUM INFECTION (FOWL TYPHOID. Nutrition and resistance, **32**; presence in calves, **364**; furazolidone treatment, **741**; **1152**; sensitivity to antibiotics, **1528**; endocrine and lymphatic changes in chicks, **2794**; isolation of S. gallinarum and S. pullorum from outbreaks, **3381**; susceptibility of various breeds, **3382**; sedimentation effect of ammonium sulphate, **3383**.
See also Salmonella Group.
SALMONELLA GROUP. S. gallinarum, S. stanley, S. typhi-suis, S. sendai, S. pullorum, S. muenchen, S. typhi-murium, S. paratyphi A and B, and S. bovis-morbificans isolated in French Guiana, **33**; a paracolon organism possessing Salmonella H antigen, **737**; bacteriophage typing, **1529**; dried antigens, **2191**; selective medium, **3385**; biochemical table of Enterobacteriaceae, **3701**; study of porcine strains, **3707**.
See also Salmonella Typhi-Murium.
SALMONELLA HEIDELBERG. See Salmonella Infection, cattle.
SALMONELLA INFECTION.
General. Detection in slaughter animals, **29**; in eggs, **34**; myocarditis in rats, **366**; synergism between "ratin" and "ratinin," **367**; in carcass meat, **1144**; of g. pigs with S. limete, **1147**; in livestock in Queensland, **1526**; in mink, **1873**; bacterial rodenticides and S. enteritidis infection, **2515**; in animal feeding stuffs, **2733**; S. enteritidis pulmonary phlebothrombosis in hamsters, **2792**; polyvalent sera, **2796**; comparison of lesions in rabbits with rinderpest, **3100**; examination of river water in Hesse, **3377**; in meat in Germany, **3703**; in meat and other foods in Bavaria, **3704**; with S. braenderup in man, from pork, **3705**; in a hare and in a buzzard, **3708**; prepared feeds in relation to salmonellosis in laboratory animals, **3878**.
See also Salmonella Typhi-Murium.
Avian. S. anatum causing death in goslings, **368**; S. new brunswick infection, **375**; **742**; **1153**; furazolidone treatment of S. pullorum, S. gallinarum, S. typhi-murium and S. thompson infection in day-old chicks, **1152**; S. reading infection in poults, **2519**; in ducks and geese, **2520**; occurrence of various types in fowls, **3101**; in aquatic birds, **3102**; antigens for poultry, **3384**; survival time in live and dead ducks, **3709**; treatment of chronic infection in pigeons, **3710**.
See also Salmonella Gallinarum Infection; Salmonella Pullorum Infection; Salmonella Typhi-Murium.
Cattle. S. gallinarum from calves, **364**; biomycin and levomycetin in calf salmonellosis and colibacillosis, **735**; in the bloodstream, **738**; pathogenesis and treatment in calves, **1143**; peat bedding as measure against S. enteritidis infection, **1145**; S. cholerae-suis from New Zealand cattle, **1524**; in North-West Germany, **1525**; with S. bovis-morbificans, **2513**; with S. heidelberg, **3098**; problem of carriers, **3378**.
Dogs. S. typhi-murium from faeces, **365**; in Osaka, **2791**.
Horses. S. bareilly isolated from a mare and her foal, **1872**.
See also Salmonella Abortus-Equi Infection.
Sheep. See Salmonella Abortus-Ovis Infection.
Swine. Nitrofurazone treatment, **2514**.
See also Salmonella Cholerae-Suis; Salmonella Group.
SALMONELLA LIMETE. See Salmonella Infection, general.
SALMONELLA MUENCHEN. See Salmonella Group.
SALMONELLA NEW BRUNSWICK. See Salmonella Infection, avian.
SALMONELLA PARATYPHI. See Salmonella Group.
SALMONELLA PULLORUM INFECTION. In Pakistan, **30**; resistance, **31**; control in the U.S.A., **376**; serological diagnosis in young chicks, **740**; eradication, **1148**; report of antigen committee, **1149**; errors in serological diagnosis, **1150**; typing, **1151**; terramycin treatment, **1527**; furazolidone treatment, **1152**; immunological studies, **1874**; aerosols for disinfection of infected poultry houses, **1875**; synthetic medium, **2192**; aureomycin treatment, **2193**; a ring test, **2516**; incidence in pheasants in Michigan, **2517**; streptomycin treatment, **2518**; rapid serum plate test, **2793**; progress in eradication, **3379**; nitrogen excretion in infected chicks, **3380**; isolation of S. pullorum and S. gallinarum from outbreaks, **3381**.
See also Salmonella Group.
SAMONELLA READING. See Salmonella Infection, avian.
SALMONELLA SENDAI. See Salmonella Group.
SALMONELLA STANLEY. See Salmonella Group.
SALMONELLA THOMPSON. See Salmonella Infection, avian.
SALMONELLA TYPHI-MURIUM. In dog faeces, **365**; L-forms, **369**; in fowls and fowl faeces, **370-371**; treatment in pigeons, poults and chicks, **372-373**; liability of meat inspector in mass food poisoning, **374**; in carcass meat, **1144**; types isolated from pigeons, **1154**; food poisoning from hens' eggs, **2434**; **2795**; survival in live and dead ducks, **3709**.
See also Salmonella Group.

SALMONELLA TYPHI-SUIS. See Salmonella Group.
SAPONINS. See Haematuria, Bovine Chronic.
SARAWAK. See Reports.
SARCOPTES. See Mange.
SARCOSPORIDIA. Histochemistry of sarcocysts, 80; differentiation of "cysts" of T. gondii and S. tenella, 439; causing muscular haemorrhages in pork, 1599; pathogenesis in pigs, 1937; clinical picture in the horse, 2253; differentiation between calcified Miescher's tubes and Trichinella, 3766.
SAWFLIES. See Poisoning, general.
SCHISTOSOMA. Intermediate host of S. turkestanicum in Pakistan, 151; serology, 493; susceptibility, 494; in cattle in Bombay, 874; nasal granuloma in West Bengal, 875; effect of 1 : 7-bis (para-dimethylaminophenoxy) heptane, 1677; in cattle in the Belgian Congo, 2009; nasal infestation of waterfowls in the Belgian Congo, 2338; bacteriological control of intermediate hosts, 2339; pigs as host of S. mansoni in Puerto Rico, 2931; study of S. incognitum, 3846; molluscicides for control of bilharziasis in Venezuela, 3847.
SCHULT-DALE TEST. See Immunology, antigens.
SCOURS. See Diarrhoea.
SCRAPIE. Attempted treatment with i/m vitamin B_{12}, 3794.
SCROTUM. See Circulatory System, vessels.
SEBORRHOEA. See Skin, diseases.
SELENIUM. See Wool.
SEMEN AND SPERMATOZOA.
General. Dog semen, 279; number of spermatozoa in relation to fertilization, 282; passage in the sow during oestrus, 283; development in the uterus of fertilizing capacity of rabbit semen, 285; spermatogenesis, 625; maturation, 626; sex drive and semen production in buffaloes, 1028; disintegration of bull spermatozoa, 1037; toxicity of heavy metals, 1430; spermicidal activity of chelating agents, 1431; speed of bull spermatozoa, 1434; polyspermy after hyperthermia in rats, 1438; ejaculation troubles in stallions, 2109; stimulative properties of s/c injected stored rabbit semen, 2114; spermatozoal invasion of the epididymis, 2115; transport in the perfused genital tract of the cow, 2116; passage in sow and mare, 2117; factors controlling ascent of spermatozoa in ovine uterine horns and fallopian tubes, 3026-3027; bacterial content of goat semen, 3126; length of day and production in rams, 3968.
See also Brucella Infection, cattle; Insemination, Artificial; Reports, international; Trichomonas Infection, general.
Collection. Electro-ejaculation in bulls, 274; 3305; in fowls, 275; electro-ejaculation in dogs, 624; in rabbits, 1436; collection and evaluation in rams, 3306; ejaculatory response to potassium chloride in lab. animals, 3636.
Diluents and additives. Chick embryo diluent, 620; saline and phosphate diluents and oxygen uptake of bull semen, 621; agglutination in yolk citrate, 1026; effect of yolk and monosaccharides on survival of frozen bull semen, 1429; effect on conception rate, 1435; survival of L. pomona in bull semen extender, 1552; effect of sodium citrate on survival after storage at −79° C., 2106; effect of antibiotics on milk-diluted semen fertility, 2107; effect of diluents and storage time on fertility of cock semen, 2113; dried skim milk for ram semen, 2441; effect of sulphanilamide on bull semen, 3024.
Storage. Of swine and horse semen, 278; revival after deep freezing, 622; effect of yolk and monosaccharides on survival of frozen semen, 1429; effect of storage time and temperature on fertility of cock semen, 3637.
See also Semen and Spermatozoa, diluents and additives.
Structure, Composition and Evalution. Evaluation of bull semen, 277; structure of semen from ruminants, 280; fertility, 281; frequency of ejaculation, production, and characteristics in bulls, 619; differentiation and counting of dead and live spermatozoa, 623; 1432; effect of sexual inactivity on quality, in bulls, 1025; fatty acids in bull semen, 1027; effect of temperature on motility and fertility, 1433; problems related to hygienic quality of bull semen, 2108; gel mass in boar semen, 2440; haemolysin in bull semen, 2737; zinc in aspermic human semen, 2744; composition of horse semen, 3023; scrotal insulation in rams and semen fructose levels, 3025; seasonal variation in buffaloes, 3307; proteins of equine seminal plasma, 3309; electron microscopy, 3965; 3966;
SENECIO. See Poisoning, plants.
"SENKOBO SKIN DISEASE." See "Streptomycosis."
SEPTICAEMIA, DUCK. See Pfeifferella Anatipestifer Infection.
SEPTICAEMIA, HAEMORRHAGIC. See Pasteurella Infection, cattle.
SEROSITIS, INFECTIOUS, OF DUCKS. See Pfeifferella anatipestifer Infection.
SERVICES, VETERINARY. In the Kazakhstan S.S.R., 616; U.S. official poultry inspection programmes, 3022.
See also Reports.
SETARIA (GRASS). See Stomatitis, General.
SETARIA (HELMINTH). Caricide treatment of "kumri," 166; invasion of the c.n.s. by nematodes, 887; factors affecting the numbers of microfilariae in the blood of horses, 888; cerebrospinal nematodiasis in cattle in Mysore, 889; in Gambian cattle, 2019; in ruminants in Austria, 2020; control in cattle by piperazine as prophylaxis against lumbar paralysis in sheep and goats, 2349-2350; in horses in the Tatar A.S.S.R., 2947; in sheep, 2948; 1-diethylcarbamyl-4-methylpiperazine dihydrogen citrate treatment, 3535; cerebrospinal nematodiasis in sheep in Israel, 3862.
SEWAGE. See Ascaris; Cysticercus; Detergents.
SEX. Sexual differentiation in cell nuclei of cats from early embryo to maturity, 270; oral smears for chromosomal sex determination, 627-628; sex drive and semen production in buffaloes, 1028; antenatal sex determination, 2457; 2458; 3983; relation between foetal sex and length of gestation, 3013.
See also Behaviour of Animals.
SEX HORMONES.
General. Causing changes in rat thymus and lymph nodes, 1005; induced mammary growth and lactation in thyroidectomized rats, 1414; book, physiology, chemistry and applications, 1840; criticism of use in vet. practice, 2123; in milk pregnant cows, 2444; 3033; effect on pullets, 2448; identification of C_{19} steroids in bovine faeces, 3314.
See also Blood, composition; Genital System, oestrous cycle; Mammary Gland.
Androgens. Effect on g. pigs, 1054; faecal excretion in cattle, 1446; action of testosterone on the epididymis in cockerels, 1817-1818; effect of testosterone on ewes, 2443; effect of oestrone and testosterone on adult canine prostate, 3639.
Gonadotrophins. In the equine placenta, 293; use in goats during anoestrus, 632; effect on ovulation in cow and sow, 1443; for treatment of ovarian cysts in cows, 2451.
See also Insemination, Artificial; Nymphomania; Pregnancy, diagnosis.
Oestrogens. In pasture plants, 183; genistein in subterranean clover, 184; in grass, 520; biogenesis, 631; action on genital and endocrine systems of g. pigs, 1035; diethylstilboestrol for treatment of anoestrus in cows, 1036; book, techniques and significance of oestrogen determination, 1085; treatment of metritis in cows, 1442; joint action of oestrone, oestradiol and oestriol, 1444; simultaneous s/c and intravaginal administration of oestrone, 1445; effect of chorionic hormone and oestrogen on rats, 1447-1448; in fodder plants, 1449; stilboestrol-contaminated food pellets causing reproductive disorders in mice, 1450; effect of genistein on mice, 1451; for suppression of barking in male dogs, 1471; effect of stilboestrol on body temp. of cockerels, 1788; urinary excretion in buffaloes, 1816; feeding cattle and lambs with diethylstilboestrol, 1822-1823; influence of alkaline diet on effect of stilboestrol implants in doe rabbits, 2124; in lucerne and other feedstuffs, 2361; effect on steers, 2445-2446; residues in beef after administration to cattle, 2447; 2731; response of bovine oestral cervix constriction to dienoestral, 2450; action on mouse vagina tissue culture, 2741; oestrogenic action of some indones and pro-oestrus induced by plan preparations, 3034; stilboestrol for early diagnosis of trichomoniasis in pregnant cows, 3132; glomerular changes induced by stilboestrol, 3315; effect of oestrone and testosterone on adult canine prostate, 3639; effect of continuous administration to rats and mice on oestrus, ovulation and fertilization, 3640; hormonal control of oestrus and ovulation in heifers, 3971; use of natural and synthetic oestrogens, 3973; use of pregnant mare serum, 3974; distribution in spayed mice of poly-oestradiol phosphate, 3975.
See also Genital System, ovaries, ova and ovulation; Poisoning, plants; Pregnancy Toxaemia; Urinary System.
Progesterone. Conception rate and ovarian function in cows injected with progesterone, 292; inhibition of oestrus and fertility in gilts, 294.
See also Insemination, Artificial; Methyloestrenolene.
Steroids. 17-Ketosteroids in the urine of stallions and geldings, 2418.
SHEEP.
General. See Adrenal Gland; Blood, composition; groups; picture; Bones, general; Circulatory System, heart; vessels; Cobalt; Digestive System, ruminant digestion; Fertility; Genital System; Growth, general; Heredity, general; Horns; Insemination, Artificial; Iodine; Liver, general; Magnesium; Nervous System, general; Parturition; Phosphorus; Salivary Glands; Sex Hormones, androgens; gonadotrophins; Skin, general; Sodium; Sugar; Wool; Zootechny.

SHEEP—[cont'd.]
Arthropod parasites. See Blowflies and Fleshflies; Mange; Oestridae, Hypoderma; Oestrus; Psorergates.
Bacterial and fungous diseases. See Actinomyces Dermatonomus; Agalactia, Contagious, of Sheep and Goats; Bacteroides; Brucella Infection; Brucella Melitensis Infection; Brucella Tularensis Infection; Clostridium Infection; Corynebacterium Infection; Dips and Dipping; Dysentery, Vibrionic; Erysipelothrix (Listeria) Monocytogenes Infection; Fusiformis Infection; Mycobacterium Johnei Infection; Mycobacterium Tuberculosis Infection, tuberculin test; Pasteurella Infection; Pleuro-Pneumonia Group; Salmonella Abortus-Ovis Infection; Trichophyton; Vibrio Fetus Infection.
Diseases, general. Infectious diseases in the Isle of Man, **215**; in Great Britain, **549**; viability of premature lambs, **2086**; book, shepherd's guide, **3658**; causes of "staggers," **3925**.
See also Anaemia, General; Cobalt; Copper; Genital System, vagina; Heredity, lethal factors; Hernia; Hypoglycaemia; Ketosis; Liver, diseases; Magnesium; Muscles; Nutrition; Poisoning; Pregnancy; Pregnancy Toxaemia; Respiratory System, diseases; lungs; Sterility; Trace Elements; Vitamins, vitamin A; Zootechny.
Helminth parasites. See Anthelmintics; Cobalt; Coenurus; Cystocaulus; Dicrocoelium; Echinococcus; Fasciola; Haemonchus; Helminth Parasites, General; Moniezia; Nematodiasis, Cerebrospinal; Phenothiazine; Setaria; Strongyloides; Trichostrongylus.
Protozoan diseases. See Anaplasma Infection; Babesia Infection; Eimeria Infection.
Virus and rickettsial diseases. See Abortion, Ovine Virus; Anaemia, Equine Infectious; Blue tongue; Dermatitis, Contagious Pustular; "Kisenyi Disease"; Ophthalmia, Ovine Contagious; Pneumonia, Ovine Virus; Pox Diseases, sheep pox; Rickettsia Infection, Q fever; sheep; Rinderpest; Scrapie; Sweating Sickness.
SHEEP POX. See Pox Diseases.
SHEEP SCAB. See Mange.
"SHIPPING FEVER." See Pasteurella Infection, cattle.
SHIZUOKA VIRUS. See Encephalomyelitis, Bovine.
SHOCK. See Blood, pressure; Electric Shock; Immunology, allergy and anaphylaxis.
SHWARTZMAN PHENOMENON. See Immunology, general.
SIERRA LEONE. See Reports.
SILAGE. Silo-filler's disease, **3936**.
See also Ketosis; Poisoning, plants.
SILVER NITRATE. See Trichomonas Infection, cattle.
SIMULIUM. In relation to Leucocytozoon infection in turkeys, **2631**; biting times of parous and nulliparous S. damnosum, **3841**.
SINUSITIS, INFECTIOUS, of TURKEYS. Egg transmission of agent, **3172**.
SIPHONA. Toxicity of diazinon vapours to horn flies, **3516**; control by insecticide-treated back rubbers, **3835-3836**; control by dusting, **3837**.
SKELETON. See Bones.
SKIN.
General. Non-keratins from avian and mammalian skin flakes, **256**; thickness in cattle, **992**; hair follicle and apocrine glands in zebu and Shorthorns, **993**; skin follicle development and growth rate in sheep, **1408**; measuring of subcutaneous tissue thickness, **1469**; seasonal variations in lamb skins, **1787**; skin structure and sweat glands in buffaloes and cattle, **2098**; incomplete wound contraction and hair growth in rabbit's skin, **2728**.
See also Immunology, general; Temperature; Vitamins, vitamin A.
Diseases. "Kasen" in Japanese horses, **553**; **2379**; impure salt and eczema in cattle, **917**; "prednisone" for eczema in dogs, **1780**; in man and animals, **2051**; cutaneous lesions as sequelae to X-ray examination of a horse, **2395**; exudate epidermitis in pigs, **3587**; seborrhoea oleosa in pigs, **3929**; action of xerosin on allergic and inflammatory reactions in g. pigs, **3946**;
See also Actinomyces Congolensis; Actinomyces Dermatonomus; Dermatophytes; Erysipelothrix Rhusiopathiae Infection; Hyperkeratosis; Neoplasms; Parakeratosis; Poisoning, plants; Rinderpest; "Streptothricosis"; Trichophyton; Vitamins, vitamin B_6.
"SKIN TUBERCULOSIS." In an ox, **2987**; reaction of cattle to tuberculin and johnin, **3249**.
SLAUGHTER. See Abattoirs and Slaughter.
"SMOG" See Air Pollution
SNAILS. See Australorbis; Limnaea; Molluscicides; Nitrates; Nitrites; Schistosoma.
SNAKES. See Venoms.
SODIUM. Distribution in cattle following i/v inj., **918**; effect of Na+ depletion on Na+ : K+ ratio in ovine parotid saliva, **2724**; effect of intracarotid infusion of NaCl on parotid saliva of sodium-depleted sheep, **3564**.
See also Digestive System, ruminant digestion.
SODIUM BISULPHATE. See Mange, general.
SODIUM CHLORIDE. See Erysipelothrix Rhusiopathiae Infection; Growth, growth factors; Poisoning, inorganic; Skin, diseases.
SODIUM COPPER CHLOROPHYLLIN. Toxicity for lambs, **1698**; producing green yolks, **1699**.
SODIUM ETHYL OXALACETATE. See Hypoglycaemia; Ketosis.
SODIUM FLUORIDE. See Wool.
SODIUM FLOROACETATE ("1088"). See Vermin Control.
SODIUM FLUOSILICATE. See Anthelmintics, for horses; for swine.
SODIUM NITRITE. See Poisoning, inorganic.
SODIUM PROPIONATE. See Ketosis; Staphylococcus Infection.
SODIUM SULPHATE. See Growth, growth factors.
SODIUM THIOSULPHATE. See Mange, general.
SOMALILAND. See Reports.
SOVENTOL. See Anaemia, Equine Infectious.
SPAIN. See Clostridium Botulinum Intoxication; Insemination, Artificial; Leishmania Infection; Poisoning, Inorganic; Vibrio Fetus Infection.
SPASTIC SYNDROME. In cattle, **3582**.
SPINA BIFIDA. See Nervous System, spinal cord.
SPINAL COLUMN. Effect of single violent trauma in dogs, **2992**.
SPINAL CORD. See Nervous System.
SPIRILLUM. Pathogenicity for g. pigs and rabbits, **2546**.
SPIROCERCA. S. lupi causing bronchitis in dogs, **2016**; S. lupi associated with oesophageal sarcoma in dogs, **3867**.
SPIROCHAETA INFECTION. Spironema cecigallorum infection in poultry, **46**; protection of fowls, **1548**; Interspira suilla, a new spirochaete from pigs, **1888**; electron microscopy, **2201**; natural infection of rabbits with trypanosomes and spirochaetes, **2983**.
SPIROMYCIN. In vitro studies, **984**.
SPIRONEMA. See Spirochaeta Infection.
"SPIROTRYPAN." See Anaplasma Infection.
SPLEEN. Biopsy in dogs, **310**; traumatic splenitis and hepatitis in cattle, **557**.
See also Distemper, Dog; Fowl Paralysis and Avian Leucosis; Immunology, antibodies and antigens; Plasmodium Infection, general; Poisoning, organic.
"SQUIRREL JAUNDICE." In report of Colonial Medical Research Committee, **2142**.
"STAGGERS." See Poisoning, plants; Sheep, diseases, general.
STAPHYLOCOCCUS INFECTION. Skin necrosis following i/d inj. of toxin, **1**; taxonomy of Micrococcus and Staphylococcus, **330-331**; penicillin resistance, **672**; effect of sodium propionate, **673**; a corynebacterial agent protecting r.b.c. from toxin, **674**; Staph. aureus causing reproductive failure in swine, **1092**; toxin causing pancreatitis, **1093**; s/c infection of chick embryos, **1482**; effect of nutritional disturbances in mice on infection, **1847**; experimental mastitis, **2473**; antistaphylocoagulase, **2474**; gangrene of the wings in chicks associated with diet, Cl. welchii type D and Staph. aureus, **2820**; bacteriology of mastitis, **3056**; phage-typing of strains associated with mastitis in cattle, **3058**; persistence of bacteriaemia following i/v inj. in rabbits, **3059**; 70 years of research, **3060**; antigenic relationship with E. monocytogenes, **3118**; antibiotic resistance of strains from dogs, **3340**; effect of tick-borne fever in lambs on resistance to staphylococci, **3520**; gastro-enteritis in man from milk of goat with mastitis, **3661**; toxicity of mastitis staphylococci, **3662**; characteristics and sensitivity to antibiotics of Staph. aureus, **3663**; antibiotics, **3664**.
STARVATION. See Nutrition, general.
STERILITY.
General. Studies, **1846**; report, Belgian committee, **3976**.
Cattle. Antibiotic treatment, **57**; **2743**; **3119**; induced, **296**; caused by mineral deficiency, **536**; caused by a virus, **832**; eradication, **1455**; in relation to bacterial flora of genital tract in cows, **1581**; book, cattle sterility and fertility, **1845**; P.M. lesions in 3 infertile bulls, **2110**.
See also Brucella Infection; Heredity, of disease; Nutrition, in relation to disease; Pseudomonas; Streptococcus Infection, cattle; Vibrio Fetus Infection; Vibrios, General.
Horses, Donkeys and Mules. Treatment in mares, **297**; cause in mules, **633**; treatment in mares, **634**.
Poultry. See Fertility; Poisoning, inorganic.
Sheep. Temporary infertility in rams associated with flooding, **2125**; early-season infertility, **3980**.
Swine. See Staphylococcus Infection.
STIFFSICKNESS. See Three-Day Fever, Bovine.
STILBOESTROL. See Growth, growth factors; Sex Hormones, oestrogens.
STILLBIRTH. See Encephalitis, Japanese.

STOMATITIS, GENERAL. Papular form in cattle, of unknown aetiology, resembling hyperkeratosis, **947-948**; papular, possibly of virus origin, **1247**; endemic, erosive, in cattle, **1378**; caused by yellow bristle grass, Setaria lutescens, **3920**.
See also Fusiformis Infection; Oestridae, Gastrophilus; Poisoning, organic.
STOMATITIS, VESICULAR. Identification and titration of virus, **443**; isolation from man, **815**; growth in tissue culture, **1605**; **2265**; **2590**; factors affecting titration in chick embryos, **1945**; insect vectors, **2861**; study of virus, **3149**; role of wild life, **3771**; exp. infection in swine, **3772**.
STOMOXYS. Back rubbers treated with insecticides for control of horn and stable flies, **3835**.
See also Erysipelothrix Rhusiopathiae Infection.
STRANGLES. See Streptococcus Equi Infection.
STREPTOCOCCI, GENERAL. Classification, **5** and **6**; differentiation of human and animal pollution by faecal streptococci, **335**; filtrable forms, **682**; characteristics of "regenerated" strains, **683**; common antigens of groups D and E, **2478**; CAMP test and T.K.T. medium, **3061**; grouping of haemolytic streptococci by precipitation and by slide agglutination, **3669**.
STREPTOCOCCUS AGALACTIAE. Typing of strains, **333**; effect of pasture and silage on resistance of milk samples, **3665-3666**.
See also Mastitis, Bovine; Streptococcus Infection, cattle.
STREPTOCOCCUS EQUI INFECTION (STRANGLES). And epidemic cough, **942-943**; disinfection in strangles, **3347**.
STREPTOCOCCUS INFECTION.
General. Haemolytic streptococcosis in g. pigs, **2155**; S. zooepidemicus infection in nutria, **2476**.
Cattle. Str. pneumoniae infection in calves, **3** and **4**; Str. agalactiae from lung abscesses of a calf, **679**; Str. pneumoniae in calves, **680**; pneumococcal types in calves and man, **681**; genital infection in cows, **1486**; facial paralysis in cattle, **2477**.
See also Mastitis, Bovine.
Horses. From genital system and aborted foetuses, **2475**.
See also Streptococcus Equi Infection.
Swine. Diplococcal meningo-encephalomyelitis in piglets, **675**.
STREPTOCOCCUS PNEUMONIAE. Virulence for g. pigs and rats, **1187**.
See also Streptococcus Infection, cattle.
STREPTOCOCCUS ZOOEPIDEMICUS. See Streptococcus Infection, general.
STREPTOLYSIN. Normal titre in domestic animals, **2770**.
STREPTOMYCIN. See Brucella Infection, general; Coryza, Avian; Erysipelothrix Rhusiopathiae Infection; Mycobacterium Johnei Infection; Pasteurella Infection, general; Salmonella Pullorum Infection; Vibrio Fetus Infection.
STREPTONIVICIN (NOVOBIOCIN). A new antibiotic, **3266** and **3267**.
"STREPTOTHRICOSIS." Actinomyces congolensis associated with "Senkobo skin disease" in cattle in Nyasaland, **401**; "Senkobo skin disease" in Northern Rhodesia, **661**; Actinomyces dermatonomus dermatitis in sheep, **1199**; **1569**; associated with rinderpest skin lesions, **1623**; S. bovis as cause of "Senkobo skin disease" in South Africa, **1909**; **3330**; possible identity with "Senkobo skin disease," **1910**; comparison of Str. bovis with Actinomyces dermatonomus, **1911**; streptothricosis in Nigerian cattle, **3126**.
STREPTOTHRIX BOVIS. See "Streptothricosis."
STRESS SYNDROME. Stress and disease, **1374**; behaviour of eosinophiles as test for stress reaction in cattle and pigs, **1791**; ultra-violet light for rearing of young animals and prevention of stress syndrome, **3303**.
See also Adrenal Gland, general; Temperature, environmental.
STRONGYLOIDES. Clinical picture of exp. Str. papillosus infestation in lambs, **3205**.
STRONGYLUS. Hyaluronidase extracts of S. equinus and S. edentatus, **1680**; S. ransomi and S. papillosus in rabbits, **2638**; effect of Bact. coli on second ecdysis of larvae in horses, **3204**.
See also Anthelmintics, for horses.
STUNNING. See Abattoirs and Slaughter.
SUCCINATE. See Digestive System, ruminant digestion.
SUCCINYL-DICHOLINE CHLORIDE. Intravenous injection, **589**.
SUDANESE REPUBLIC. See Glossina; Leishmania Infection.
SUGARS. Placental transfer in sheep, **914-915**; utilization in cattle off i/v invert sugar, glucose and fructose, **2977**.
See also Blood, composition; Carbohydrates; Hypoglycaemia.
SULPHADIMIDINE. See Eimeria Infection, avian, general; Pneumonia, Porcine Virus.
SULPHAMERAZINE. See Eimeria Infection, cattle.
SULPHAQUINOXALINE. For cattle, **593**; causing anaemia in fowls, **1779**.
See also Eimeria Infection, avian; cattle; Poisoning, therapeutic substances.
SULPHONAMIDES, GENERAL. Evaluation in mouse toxoplasmosis, **1221**.
See also Eggs, Hen; Pneumonitis, Mouse Virus.
SULPHUR. See Digestive System, ruminant digestion; Hair.
SUMMER MASTITIS. See Corynebacterium Infection.
SURAMIN. See Trypanosoma Infection, general.
SURINAM. See Rabies.
SWAMP FEVER. See Anaemia, Equine Infectious.
SWANS. See Echinoparyphium.
SWAYBACK. See Copper.
SWEATING AND SWEAT GLANDS. See Blood, composition; Casein, Iodinated; Skin, general; Temperature.
SWEATING SICKNESS. A tick-borne disease of cattle, sheep, goats and pigs, **90**.
SWEDEN. See Haplosporangium; Leucosis, Bovine; Pleuro-Pneumonia Group; Vibrio Fetus Infection.
SWINE.
General. See Anaesthesia and Analgesia; Blood, groups; Cadmium; Calcium; Casein, Iodinated; Digestive System, general; fauna and flora; intestines; Growth, growth factors; Hygiene, livestock; Insemination, Artificial; Iron; Liver, general; Pituitary Gland; Phosphorus; Pregnancy, general; Semen and Spermatozoa; Vitamins, vitamin A; vitamin B; vitamin B_{12}; Zootechny.
Arthropod parasites. See Mange.
Bacterial and fungous diseases. See Brucella Infection; Clostridium Botulinum Intoxication; Clostridium Infection; Corynebacterium Infection; Digestive System, diseases; Dysentery, Vibrionic; Enteritis, Porcine; Eperythrozoon; Erysipelothrix Monocytogenes Infection; Erysipelothrix Rhusiopathiae Infection; Foot Rot; Haemophilus Suis; Leptospira Infection; Lymphadenitis, Porcine Caseous; Mycobacterium Tuberculosis; Mycobacterium Tuberculosis Infection, general; Nocardia; Pasteurella Infection; Pfeifferella Whitmori Infection; Polyserositis, Porcine Infectious; Rhinitis, Porcine Atrophic; Salmonella Infection, swine; Spirochaeta Infection; Staphylococcus Infection; Streptococcus Infection.
Diseases, general. Causes of death in newborn pigs, **1752**; differentiation of some clinical syndromes in pigs, **2384**; "toxic dyspepsia" and dysentery in piglets, **2549**; B.V.A. publication on husbandry and diseases of pigs, **3926**.
See also Anaemia, General; Books, diseases, general; Cannibalism; Copper; Emphysema; Genital System, uterus; Glucose; Histamines; Hygiene, livestock; Irradiation; Kidneys; Leucosis; Liver, diseases; Manganese; Nervous System, spinal cord; Nutrition, in relation to disease; Oedema Disease; Parakeratosis; Parasiticides, toxicity; Poisoning; Porphyria; Rhinitis, General; Rhinitis, Porcine Atrophic; Skin, diseases; Stress Syndrome; Syncope, Fatal; Teratology; Trembles.
Helminth parasites. In slaughter pigs, **167**.
See also Anthelmintics; Metastrongylus; Oesophagostomum; Schistosoma; Trichinella.
Protozoan diseases. See Babesia Infection; Eperythrozoon; Sarcosporidia; Toxoplasma Infection; Trichomonas Infection, cattle.
Virus and rickettsial diseases. A disease in Japan with nervous symptoms, caused by a "haemagglutinating virus," **2300-2302**.
See also Aujeszky's Disease; Encephalitis, Japanese; Encephalomyelitis, Porcine; Exanthema, Vesicular; Gastro-Enteritis, Porcine Transmissible; Influenza; Newcastle Disease; Paralysis; Pneumonia, Porcine Virus; Respiratory System, lungs; Stomatitis, Vesicular; Sweating Sickness; Swine Fever; Swine Fever African.
SWINE ERYSIPELAS. See Erysipelothrix Rhusiopathiae Infection.
SWINE FEVER. Experimental study, **453**; precipitation test, **834**; lapinized virus and vaccines, **1252**; **1253**; **2299**; **2881**; **3798**; **3799**; temperature curve in rabbits, **1254**; low protein ration and immunization, **1255**; control, **1628**; histology of autonomic nervous system, **1629**; crystal violet vaccine, **1630**; **1970**; **2297-2298**; **2607**; **2882-2883**; **3800**; reaction of infected pigs to Sarnowiec's antigen, **1968**; losses after vaccination in piggeries where liver cirrhosis had occurred, **1969**; evaluation of vaccines, **2296**; problems, **2605**; bronchopneumonia following immunization with crystal violet vaccine, **2607**; Oesophagostomum, swine erysipelas and swine fever, **2641**; differential diagnosis from poisoning, **2702**; histology of the c.n.s. after use of crystal violet vaccine, **2883**; plasma viscosity, **2884**; cytopathological changes in tissue culture from infected pigs, **2885**; mixed infection with Bact. pyosepticum (viscosum), **2886**; virus propagation in baby mice, **2887**; effect of crystal violet vaccine on blood grouping in swine, **2919**; prothrombinaemia in exp. infection, **3161**; virus variations, **3475**; mixed infection with Corynebact.

SWINE FEVER—[cont'd.]
pseudopyogenes, **3476**; tissue vaccines, **3477-3478**; leucopenia as a diagnostic aid, **3795**; control in Switzerland, **3796**; immunization in the U.S.S.R., **3797**; simultaneous serum-crystal violet vaccine inoculation, **3801**; recent developments in immunization, **3802**; effect of high levels of chlortetracycline in the ration on immunization, **3803**;
SWINE FEVER, AFRICAN. In Angola, **2295**; **3804**.
SWITZERLAND. See Brucella Group; Brucella Infection, cattle; sheep and goats; Oestridae, Hypoderma; Swine Fever.
SYNCOPE, FATAL, OF PIGS. Aetiology, **224**; **3250**; role of adrenal glands, **2387**.
SYNGAMUS. Occurrence in fowls of S. merulae, a gapeworm of wild birds, **506**; barium potassium antimonyltartrate treatment, **1682**.
SYNOVITIS, INFECTIOUS, AVIAN. See Tendovaginitis-Arthritis Syndrome, Avian.

T

TAENIA. See Coenurus; Cysticercus.
TANGANYIKA. See Glossina; Poisoning, inorganic; Reports.
TANTALUM. See Radiations.
TAPEWORMS. See Anthelmintics, for poultry.
TASMANIA. See Thyroid Gland; Trace Elements.
TECHNIQUE AND APPARATUS.
Bacteriological. A disposable plastic petri dish, **1466**; gluconate test for bacterial characterization, **1903**; rapid cultivation of acid-fast bacilli, **2173**; rapid method for determination of viable bacteria in cultures, **2464**; demonstration of living bacteria in cover glass culture, **3038**; preservation of bacteria, **3326**; continuous culture of bacteria, **3414**; automatic control of pH in cultures, **3646**; magnetically induced vortex for aerated culture studies, **3647**.
See also Bacillus Anthracis Infection; Bacterium Coli; Freeze-Drying; Immunology; Leptospira Infection, general; Mycobacterium Tuberculosis; Mycobacterium Tuberculosis Infection, diagnosis; Pleuro-Pneumonia Group.
Collection of body tissues and fluids. Aspiration biopsy, **3648**.
See also Blood, general; Bones; Circulatory System, heart; Semen and Spermatozoa; Spleen; Urinary System, general.
Immunological. Quantitative study of double diffusion in agar, **3992**.
See also Immunology.
Miscellaneous. Histochemical methods, **1061**; new design of syringe, **1064**; book, sampling techniques, **1087**; measurement of moisture in biological materials, **1467**; transportable operating table for farm animals, **1470**; book, cultivation of animal and plant cells, **1476**; spiral loops in serology and virology, **1825**; isolation equipment for baby pigs, **2461**; prevention of syringe contamination when changing needles, **3039**; textbook, practical microbiology, **3045**; temporal bone microtomy, **3993**; books, diagnostic methods, **4002**; **4004**.
See also Anaesthesia and Analgesia; Antibiotics, General; Blood; Books, miscellaneous; Electron Microscopy; Electrophoresis; Irradiation; Isotopes, Radioactive; Sex Hormones, oestrogens; Temperature, body; Tetrazolium-Reduction Test; Tissue Culture.
Parasitological. Counting helminth ova, **2021**; medium for rendering arthropods translucent for microscopy, **3519**; cultivation of nematode larvae in sheep faeces, **3525**.
See also Fasciola; Lice; Parasiticides.
Staining. Mechanism of the Gram stain, **649**; staining method for frozen sections, **651**.
See also Fungi, General; Mycobacteria, General.
Viruses. Use of spiral loops, **1825**.
See also Encephalomyelitis, Mouse; Encephalomyelitis, Porcine; Rinderpest; Tissue Culture; Viruses, General.
TEETH. Caries in dogs, **227**; relationship of vitamins A and E to iron content of rats' teeth, **538**; maternal diet and resistance to caries in young rats, **3225**.
See also Calcium; Porphyria.
TELANGIECTASIS. See Liver, diseases.
TEMPERATURE.
General. Heat stress and sweat loss index, **254**; tissue survival at low temperatures, **273**; sweat gland function in cattle, **599**; rectal temp. and repiratory response of crossbred cows in the tropics, **640**; bovine environmental physiology and shelter engineering, **1014-1016**; **1412**; **3272-3274**; photoperiodicity, type of coat and heat regulation in cattle, **1410**; assessment of moisture exuded through the bovine skin, **2415**; adrenergic sweating in cattle, **2416**.
See also Hygiene, livestock.
Body. Of camels, **253**; rectal and deep body temp. of calves, **598**; effect of hypothermia on organs, **607**; diagnostic value of skin temp., **965**; galvanometer, for determination in slaughter pigs, **1065**; effect of stilboestrol in cockerels, **1788**; effect of "epirenamin" (adrenalin), **2084**; hypothermia by internal cooling, **3625**; in zebu and zebu crosses in tropical countries, **3628**; apparent periodicity in body temp., blood picture and daily milk yield in cows, **3629**; heat increments associated with feeding in ruminants, **3883**.
See also Foreign Body Syndrome, Cattle; Milk and Milk Products; Mycobacterium Tuberculosis Infection, tuberculin test; Nervous System, general; Respiratory System, diseases.
Environmental. Acclimatization of fowls, **308**; effect on skin and body temp., respiration and heart rate in calves, **641-646**; critical temperatures for cattle and man, **990**; effect on milk production, **1049**; heat tolerance in monotremes and marsupials, **1050**; effect of 45° C. on hydration of blood in calves, **2091**; respiratory response in calves to thermal stress, **2095**; effect on onset of breeding season and fertility in sheep, **2112**; effect on sucking pigs and milk yield, **3990**.
See also Blood, composition; Dermanyssus; Embryos, Fowl; Genital System, ovaries, ova and ovulation; Hygiene, livestock; Magnesium; Nematodirus.
TENDONS. Rupture of gastrocnemius tendon in pullets, **567**.
See also Joints; Perosis; Tendovaginitis-Arthritis Syndrome, Avian.
TENDOVAGINITIS-ARTHRITIS SYNDROME, AVIAN. Isolation of agent, **1283**; a study, **1284**; in turkeys, **1285**; aetiology, **2320**; transmission and therapy studies in chicks, **3501**.
TERATOLOGY. Congenital malformation in piglets, **3321**.
See also Heredity; Influenza, general; Irradiation; Nervous System, diseases; Newcastle Disease, virus; Porphyria; Pteroylglutamic Acid; Vitamins, vitamin B (riboflavin).
TERRAMYCIN. See Oxytetracycline.
TESCHEN DISEASE. See Encephalomyelitis, Porcine.
TESTOSTERONE. See Sex Hormones, androgens.
TETANUS. See Clostridium Tetani Infection.
TETANY. See Magnesium.
TETRACHLORETHYLENE. See Anthelmintics, for cattle; sheep.
TETRACYCLINE. Distribution in the body, **1405**.
See also Pasteurella Infection; Pneumonia, Caprine Virus; Pneumonia, Porcine Virus; Pneumonitis, Feline; Poisoning, therapeutic substances.
TETRAMERES. T. mohtedai in fowls, **509**.
TETRAZOLIUM-REDUCTION TEST. For milk, **2101**.
THALLIUM. See Chronic Respiratory Disease; Poisoning, inorganic.
THEILERIA INFECTION. Corridor disease in Zululand, **809**; biomycin and "morphiplasmin" treatment, **1932**; aminoacridine treatment, **2249**; **3434**; "babesin" and "yatren" in East Coast fever, **2580**; combined therapy in cattle, **2581**; classification, **2855**; exp. transmission of T. ovis (Gonderia) by Rhipicephalus evertsi, **2856**; chemoprophylaxis in cattle, **3137**; quinacrine and paludrine treatment of T. dispar infection in cattle, **3138**; probably tick-transmitted, **3330**; T. recondita and Babesia motasi infection in sheep in Germany, **3760**.
THEILER'S VIRUS. See Encephalomyelitis, Mouse.
THELAZIA. Control of ocular infestation in cattle, **3534**.
THERAPEUTICS. See Pharmacology and Materia Medica, General.
THIAMBUTENE. See Anaesthesia and Analgesia.
THIAMINE. See Vitamins.
THIOCYANATES. See Cauliflower.
THIOPENTONE SODIUM. See Anaesthesia and Analgesia.
THREE-DAY FEVER, BOVINE. In cattle in Transvaal, **97**.
THREONINE. See Liver, diseases.
THROMBOPLASTIN. See Blood, platelets.
THYMUS. Changes caused by cortisone and sex hormones, rats, **1005**; seasonal recrudescence in adult birds, **2727**.
THYROID GLAND. Endemic goitre in man and animals in South Africa, **210** and **211**; effect of l-thyroxin on calves, **212**; effect of phenothiazine on I^{131} uptake, **248**; **3007**; **3265**; and caecal coccidiosis in chicks, **801**; effect of cauliflower in cattle, **904**; effect of phenothiazine in sheep, **2411**; cause of endemic goitre in Tasmania, **2686**; goitre of man and animals in Turkey, **2687**; seasonal histological changes in buffaloes, **3292**; iodine and thyroid activity in fowls, **3566**; ossification in dogs, **3867**; thryoid secretion rate in cows studied with I^{131}, **3912**.
See also Casein, Iodinated; Growth, growth factors; Iodine; Sex Hormones, general; Vitamins, vitamin A.
"TIARGEN." See Babesia Infection, cattle.
TICK-BORNE FEVER. See Rickettsia Infection, cattle; sheep.
TICK PARALYSIS. Neuromuscular block in tick paralysis, **3842**.

TICKS.
General. Resistance to insecticides, **147**; control of cattle ticks, **492**; favourite sites of attachment on grazing animals, **2927**.
See also Brucella Tularensis Infection; "Kisenyi Disease"; Rabies, general; Rickettsia Infection, general; cattle; sheep; Sweating Sickness.
Argasidae. See Rickettsia Infection, Q fever.
Ixodidae. Control of the Lone Star tick, Amblyomma americanum, **873**; B. microplus infestation of undipped cattle, **1313**; arsenic resistance of B. microplus, **1314**; non-parasitic stage of B. microplus, **1315**; infesting the udder of cows, **1316**; viability of Babesia caballi in H. plumbeum, **1593**; control of B. microplus by destocking of pastures, **1675**; D.D.T. resistant B. microplus in Queensland, **2633**; exp. transmission of Theileria ovis by Rh. evertsi, **2856**; effect of self-licking by cattle on B. microplus infestation, **3190**; diazinon and malathion for cattle tick control in Australia, **3191**; control of chlordane-resistant Rh. sanguineus, **3192**; cattle tick eradication in Australia, **3517**; cultivation of B. microplus on chick embryos, **3158**.
See also Babesia Infection, general; horses; sheep.
TISSUE CULTURE. Technique, **135**; **1646**.
See also Aujeszky's Disease; Encephalomyelitis, Porcine; Foot and Mouth Disease, virus; Hepatitis, Canine Virus; Newcastle Disease, general; Rickettsia Infection, Q fever; Stomatitis, Vesicular.
TITANIUM. See Growth, growth factors.
TOBACCO. See Newcastle Disease, immunology.
TOCOPHEROL. See Vitamins, vitamin E.
TOLUENE. See Anthelmintics, for horses.
TONGUE. See Actinobacillus; Heredity, of disease; Nutrition, in relation to disease.
TORULOPIS. Causing endocarditis in a bull, **1905**.
TOXAPHENE. See Parasiticides, toxicity.
TOXOCARA. Life history and development of T. cati, **3214**.
TOXOPLASMA INFECTION.
General. In tissues of man and pets, **438**; differentiation from Sarcocystis tenella, **439**; in dog, cat, mink and chinchilla in Canada, **1933**; laboratory diagnosis, **1935**; with distemper in mink, **2611**; myocardial form in man, **3143**; tissue culture of T. gondii, **3144**; storage at −70° C., **3440**; comparative pathogenesis, **3441**; preservation by freezing, **3765**.
Dogs and Cats. In dogs, **435**; **1597**; **1598**; concurrent with distemper, **436-437**; in a cat, **1936**; clinical forms in dogs and cats, **3142**; in dogs in England, **3439**.
See also Toxoplasma Infection, general; immunology.
Fowls. Diagnosis, **78**; experimental, **79**; in Denmark, **2252**.
Immunology. Serological examination of man and dogs in Algiers, **77**; serological evidence, **2584**; c.f. test, **2585**; immunization experiments with killed suspension, **3763**;
Rodents. Sulphonamide treatment in mice, **1221**; in rabbits in England, **2251**; in hares in Germany, **3761**; exp. ocular infection of rabbits, **3764**.
Swine. From milk, placenta and offspring of carrier sows, **810**; in pigs, **1934**; **2583**.
TRACE ELEMENTS. Deficiencies, **1718**; deficiencies in sheep and cattle in Tasmania, **3567**.
See also Haemonchus; Vitamins, vitamin E.
TRANSPORT OF ANIMALS. Problems, **1428**; **1820**.
TRAUMA. Biochemical response, **608**.
TREMBLES. In piglets, **1384**; **2698**.
TRICHINELLA. In dogs in Greenland, **154**; destruction in meat by cold, **155**; flocculation test for diagnosis, **497**; immunity in mice, **498**; effect of cortisone on non-immunized mice, **499**; irradiation of larvae and immunity, **1320**; in Arctic and Antarctic mammals, **2341**; study, **2342**; differentiation from calcified Miescher's tubes, **3766**; from the bladder of a pig, **3851**; control, **3852**.
TRICHLORETHYLENE. See Poisoning, organic.
TRICHOCIDIN. A Penicillium product against protozoa, **789-795**.
TRICHOMONAS INFECTION.
General. Preservation at −79° C., **72**; elimination from semen by glycerol, **1586**; transmission to laboratory animals, **1587**; **3756**; mucolytic action of T. foetus, **2570**; serological comparison of T. vaginalis with T. foetus Belfast and T. foetus Manley, **2846**; viability during freezing and thawing, **3757**.
Avian. Treatment in pigeons, **788**.
Cattle. A "trichomonad cyst," **70**; in Poland, **71**; **2844**; silver nitrate treatment, in bulls, **787**; electrophoresis and serology in calves from birth to weaning, and after inj. of antigen, **861**; diagnosis in bulls, **1212-1213**; serology of a Queensland strain, **1214**; antrycide and phenothiazine treatment, **1588**; in an artificial insemination bull stud, **1918**; in the epididymis, **1919**; diagnosis, **1920**; associated with leucocyte clusters, **1921**; in cattle with porcine trichomonads, **1922**; chloramine treatment in bulls, **2571**; synthetic octane for cows, **2572**; serological studies, **2845**; early diagnosis in pregnant cows with stilboestrol, **3132**; bis - p - chlorophenyldiguanidohexane ("hibitane," "nolvasan" or "chlorhexidine"), a new disinfectant against bovine vibriosis and trichomoniasis, **3270**; treatment in bulls, **3754**; reaction of calves to antigen, **3755**.
TRICHOPHYTON. Nomenclature, **63**; eradication in farm animals in the U.S.S.R., **1193**; treatment in cattle, **1194**; disinfection, **1195**; causing alopecia in g. pigs, **1196**; animal type in man, **1197**; in man and animals, **1198**; indirect transmission of T. discoides to man, **1568**; T. megnini ringworm in cattle, **1906**; classification, symptoms and treatment, **1907**; persistent T. rubrum infection of skin, hair and nails, **1908**; ringworm in g. pigs, caused by T. mentagrophytes, **2827**; in sheep, **2828**; favus in fowls caused by T. gallinae, **3737**.
TRICHOSOMOIDES. T. crassicauda causing lung lesions in rats, **3859**.
TRICHOSTRONGYLUS. Pathogenicity of T. axei, **502**; experimental hosts, **503**; parasitic gastro-enteritis in goats, **882**; tetrachlorethylene treatment of T. axei in sheep, **1681**; inheritance of resistance in sheep, **2345**; control in goats by phenothiazine, **2932**; tetrachlorethylene against T. axei in cattle, **3206**; exp. infection of g. pigs with T. colubriformis, **3853**.
TRIETHYLENEMELAMINE. See Leucosis, bovine.
TRIFOLIUM. See Poisoning, plants; Sex Hormones, oestrogens.
TRINIDAD AND TOBAGO. See Reports.
TRIORTHOCRESYL PHOSPHATE. See Vitamins, vitamin E.
"TROMALYT." See Growth, growth factors.
TRYPAN BLUE. See Mange, dogs.
TRYPANOSOMA BRUCEI. See Trypanosoma Infection, general.
TRYPANOSOMA CONGOLENSE. See Trypanosoma Infection, general.
TRYPANOSOMA EQUIPERDUM. Electron microscopy, **2841**; behaviour of mixture of oxophenarsine-resistant and normal strain, in rats, **2842**; mixed infection with Borrelia duttoni in mice, **3131**.
See also Trypanosoma Infection, horses.
TRYPANOSOMA EVANSI. Revision of the morphology and taxonomy, **3751**.
See also Trypanosoma Infection, general.
TRYPANOSOMA INFECTION
General. Report of the West African Institute for Trypanosomiasis Research, **416**; **3427**; transmission of T. vivax by G. palpalis, **784**; effect of starvation on T. evansi infection in rats, **785**; "berenil" treatment, **1218-1219**; report, East Africa Commission, **1582**; natural reservoir of T. rhodesiense, **1583**; Colonial Office report, **1924**; response in domestic animals to T. vivax, T. congolense and T. brucei, **2240**; effectiveness of furacillin and antrycide, **2242**; prophylactic value of suramin complexes, **2568**; natural infection in rabbits with spirochaetes and trypanosomes, **2983**; report of committee on human and animal infection in Southern Rhodesia, **3130**.
Cattle. In horses and cattle in Panama, **782**; ethidium bromide treatment, **1210**; prophylaxis, **3752**.
Horses. Chemotherapy, **69**; in horses and cattle in Panama, **782**; antrycide in dourine, **1584-1585**; dourine control in Uzbekistan, **2239**; eradication of dourine in Stavropol, **2567**.
TRYPANOSOMA MEGA. Change from culture form to blood stream form, **3753**.
TRYPANOSOMA RHODESIENSE. See Trypanosoma Infection, general.
TRYPANOSOMA VIVAX. Effect of antibody on respiratory rate, **2241**; metabolic studies, **3428**.
See also Trypanosoma Infection, general.
TUBOCURARINE CHLORIDE. See Clostridium Botulinum Intoxication; Clostridium Tetani Infection.
TULARAEMIA. See Brucella Tularensis Infection.
TUMOURS. See Neoplasms.
TURKEY. See Haematuria, Bovine Chronic; Thyroid Gland.
TURKEYS. Turkey mortality, **2050**.
See also Blowflies and Fleshflies; Candida; Chronic Respiratory Disease; Circulatory System, vessels; Cryptosporidium; Diphenyl-Para-Phenylene Diamine; Erysipelothrix Rhusiopathiae Infection; Eyes, diseases; Growth, growth factors; Hexamita Infection; Histomonas Meleagridis Infection; Leucocytozoon Infection; Nutrition, general; in relation to disease; Perosis; Poisoning, inorganic; Psittacosis; Pullet Disease; Salmonella Infection, avian; Simulium; Sinusitis, Infectious; Tendovaginitis-Arthritis Syndrome, Avian; Vitamins, vitamin B (folic acid); vitamin E.
TYMPANITES. See Bloat.
TYRAMINE. See Digestive System, ruminant digestion.
TYROTHRICIN. See Bacterium Coli.
TYZZER'S DISEASE. In laboratory mice, **3590**.

U

UGANDA. See Reports.

ULTRASONIC WAVES. Produced by some mammals, **257**; accelerating growth in rats, **998**; therapy in horses, **3009**.
See also Clostridium Botulinum Infection; Mastitis, Bovine.

ULTRA-VIOLET LIGHT. See Aujeszky's Disease; Hygiene, food; Rift Valley Fever; Stress Syndrome.

UNCINARIA. See Anthelmintics, for dogs.

UNION OF SOUTH AFRICA. See Mycobacterium Tuberculosis Infection, general; Reports; Rhinitis, Porcine Atrophic; "Senkobo Skin Disease"; Theileria Infection; Three-Day Fever, Bovine; Thyroid Gland.

UNION OF SOVIET SOCIALIST REPUBLICS. See Abortion, Equine Virus; Anaplasma Infection; Diseases, General; Helminth Parasites, General; "Khutili" Disease; Mycobacterium Tuberculosis Infection, general; Pleuro-Pneumonia, Caprine Contagious; Research Institutes; Respiratory System, lungs; Rickettsia Infection, Q fever; Services, Veterinary; Setaria; Swine Fever; Trichophyton; Trypanosoma Infection, horses.

UNITED KINDOM. See Cat-Scratch Fever; Clostridium Infection, cattle; Cysticercus; Encephalomalacia, Avian; Erysipelothrix (Listeria) Monocytogenes Infection; Fungi, General; Leptospira Infection, cattle; Muscles; Myxomatosis; Nematodirus; Paramphistomum; Reindeer; Reports; Rhinitis, Porcine Atrophic; Sheep, diseases, general; Toxoplasma Infection; Zootechny.

UNITED STATES OF AMERICA. See Anaplasma Infection; Bacillus Anthracis Infection; Bluetongue; Books, pharmacology and materia medica; "Brisket Disease"; Brucella Tularensis Infection; Diphenyl-Para-Phenylene Diamine; Diseases, General; Influenza, swine; Liver, diseases; Leucocytozoon Infection; Mastitis, Bovine; Mucosal Disease; "Muzzle Disease"; Mycobacterium Tuberculosis Infection, general; Newcastle Disease; Oestridae, Hypoderma; Poisoning, plants; Psittacosis-Lymphogranuloma Group; Rabies; Reports; Rhinitis, Porcine Atrophic; Rhinotracheitis, Infectious Bovine; Rickettsia Infection, general; Salmonella Pullorum Infection; Services, Veterinary; Viruses, General.

UREA. In growing pigs, **1710**.
See also Blood, composition; Poisoning, organic.

URINARY SYSTEM.
General. Diuretic factor in pregnant mares' urine, **272**; catheter for urine collection from cows, **653**.
See also Leptospira Infection, general; Sex Hormones, steroids; Vitamins, vitamin E.
Diseases. Ischuria in dogs and cats, **1389**; fluorine in urinary calculi, **2401**; amino acid pattern in urine and blood in a cystinuric labrador, **2960**; cystine calculi in mink, **2961**; obstruction of the urinary tract in buffaloes, **3568**; vitamin A deficiency and calculi in cattle, **3569**.
See also Capillaria; Ketosis; Liver, bile; Trichinella.

V

VAGINITIS, CATARRHAL. In cattle, **2603**.

VASOPRESSIN. See Pituitary Gland.

VENEZUELA. See Clostridium Infection, cattle; Histoplasma Capsulatum; Schistosoma.

VENOMS. Snake bite in cattle, **241**.

VERMIN CONTROL. Synergism of "ratin" (S. enteritidis var. danysz) and "ratinin" (a red squill rodenticide), **367**; rodenticidal effect of endrin, **2103**; trapping yards for kangaroos, **2134**; danger of bacterial rodenticides, **2515**; pival, an anticoagulant rodenticide, **2734**; sodium fluoroacetate ("1088") for rabbit control, **3299-3300**.
See also A.N.T.U.; Myxomatosis; Poisoning, general.

VIBRIO FETUS INFECTION. Abortion in cattle, **49**; antigenic aspects, **50**; antibiotic treatment of vibrionic sterility in cows, **51**; mucus-agglutination test, **397**; causing temporary infertility in Sweden, **769**; abortion in ewes in Spain, **770**; antigenic structure, **771**; cultivation, **772**; vaginal mucus agglutination test in Swedish cattle, **1179**; in Germany, **1180**; **2217**; **2821**; **3728**; recovery from bulls and cows, **1181**; studies, **1182-1183**; transmission of bovine strains to ewes, **1184**; human infection, **1185**; experimental research in heifers, **1561**; serology and biochemistry of bovine strains, **1562**; c.f. test, **1896**; effect of infected bulls on non-return rates and embryonic mortality, **1897**; streptomycin treatment, **1898**; resistance to antibiotics and other therapeutics, **1899**; incidence of vibrios other than V. fetus in cattle, **1900**; culture method for isolation, **2218**; experimental infection in laboratory animals, **2219**; serological variants, **2220**; gaseous requirements for growth, **2221**; pathogenicity for g. pigs and rabbits, **2546**; chlorhexidine, a new disinfectant, **3270**; in vitro and in vivo studies with antibiotics, **3413**; a brief account, **3727**; in cattle and sheep in France, **3729**; biochemistry of bovine strains, **3730**; antigen sensitivity of strains in relation to growth phase and morphology, **3731**; nutritional factors, **3892**.
See also Vibrios, General.

VIBRIO JEJUNI. See Dysentery, Vibrionic.

VIBRIO SUIS. See Dysentery, Vibrionic; Vibrios, General.

VIBRIOS, GENERAL. Occurrence in cattle of vibrios other than V. fetus, **1900**; significance of various vibrios in bovine sterility, **2545**; lyophilization of V. fetus and V. suis culture material, **2822**.
See also Dysentery, Vibionic.

VIETNAM. See Pfeifferella Whitmori Infection.

VIOMYCIN. Sensitivity of some microorganisms, **2224**.

VIRUS ABORTION OF EWES. See Abortion, Ovine Virus.

VIRUS ABORTION OF MARES. See Abortion, Equine Virus.

"VIRUS DIARRHOEA-INDIANA." See Mucosal Disease.

VIRUSES, GENERAL. Cultivation in fish embryos, **91**; cytopathogenicity of animal viruses in vitro, **134**; book, advances in virus research, **323**; pathology of infected cells, **476**; suppression of haemagglutinating viruses, **477**; beta propiolactone-inactivated vaccines, **478**; transmission by arthropods, **479**; **1991**; Boshyan's theory on the nature of viruses and bacteria, **856-857**; infections of the embryo and foetus, **1236**; the proposed Myxovirus group, **1237**; cattle diseases new to California, **1248**; canine virus forum, **1265**; problems in connexion with identification by animal experiments, **1271**; advances in research, **1288**; titration in baby mice, **1613**; virucidal activity of WC-90, a hypochlorous acid derivative, **1617**; neutralization with lymphoid cell and node material, **1990**; carriers of virus diseases, **2325**; inactivation by gamma irradiation, **2326**; new viral agents recovered from monkey kidney tissue culture cells, **2619**; immunity of chicks from infected eggs, **2866**; serological differentiation of equine virus abortion, human and swine influenza, mumps and Newcastle disease, **2878**; multiplication in mosquitoes, **2911**; structure of small viruses, **2912**; resistance of viruses to chloroform, **3178**; concentration of amniotic and allantoic fluid infected with virus, by polyvinylpyrrolidone, **3179**; antiviral activity of acridine, **3464**.
See also Immunology, complement and complement fixation; Mepacrine; Poliomyelitis; Radiations; Respiratory System, lungs; Swine, virus and rickettsial diseases; Technique, viruses; Tissue Culture.

VITAMINS.
General. Distribution in food stuffs, **3578**; cortisone-vitamin interactions, **3579**.
See also Immunology, antibodies and antigens; Newcastle Disease.
Vitamin A. Deficiency as cause of blindness in cattle, **204** and **205**; factor in udder tissue influencing milk content, **924**; ovine keratoconjunctivitis from deficiency, **925**; metabolism in calves, rabbits and rats, **926**; effect of cortisone on rats with hypervitaminosis, **1363**; influence on epidermis, **1722**; metabolism, in infection, **1723**; effect of octachloronaphthalene on metabolism, **1724**; deficiency in beef cattle, **2042**; action of large doses in pigs, **2680**; liver content in sucking pigs, **2972**; calcium, phosphorus and nitrogen metabolism in deficient rats, **3235**; deficiency and urinary calculi in cattle, **3569**; content in pigs ascertained by liver biopsy, **3901**; effect of l-thyroxine on carotene and vitamin A metabolism in the cow and chick, **3902**.
See also Blood, composition; Hyperkeratosis; Teeth.
Vitamin B (complex). Effectiveness of antibiotics in rats following oral or s/c administration, **1347**; comparative value of synthetic riboflavin and natural B complex feeds for poultry, **1364**; effect on survival of chicks with high mortality rate, **3592**.
Vitamin B (folic acid). Exp. deficiency in cats, **1726**; congenital abnormalities in rats caused by deficiency during pregnancy, **1727**; folic acid deficiency in g. pigs, **3573**; requirements of hen turkeys, **3907**.
Vitamin B (nicotinic acid). 6-aminonicotinamide—a nicotinamide antagonist, **1365**.
Vitamin B (pantothenic acid). Requirement of baby pigs, **1728**; effect on reproduction in sows, **2045**; deficiency in the chick, **3574**.
See also Corynebacterium Infection, general.
Vitamin B (riboflavin). Comparative value of synthetic riboflavin and natural B complex feeds for poultry, **1364**; deficiency as cause of congenital abnormalities in rats, **2371**.
Vitamin B_1 (thiamine). Response of dogs to oral doses, **207**; effect of dietary manganese and thiamine on rats, **1360**; requirement of the baby pig, **1729**; deficiency encephalopathy in cats, **3908**.
See also Brucella Infection, general; Corynebacterium Infection, general; Oedema Disease of Pigs.
Vitamin B_6 (pyridoxine). Skin symptoms of deficiency in dogs, **1730**; deficiency in rabbits, **3575**; effect on erythropoiesis in rats, **3576**.
See also Corynebacterium Infection, general.

VITAMINS—[cont'd.]
Vitamin B_{12}. Absorption from avian caecum, **541**; deficiency in chick embryos, **930**; in built-up litter, **1023**; effect of penicillin and B_{12} on debilitated horses, **2031**; effect of large doses on rat reproduction, **2372**; report of the Analytical Methods Committee, **2682**; requirements of rats, **3577**.
See also Blood, composition; Cobalt; Scrapie.
Vitamin C. Deficiency causing blood in milk, **931**; ascorbic acid and experimental TB. in g. pigs, **3683**.
See also Brucella Infection, general; Hyperkeratosis; Liver.
Vitamin D. Anti-rachitic action, **206**; and magnesium absorption, **2681**.
See also Encephalomyelitis, Porcine; Milk Fever.
Vitamin E (tocopherol). Effect of triorthocresyl phosphate on metabolism in calves, **927**; deficiency causing paralysis in ducklings, **928**; aortic lesions in deficient animals, **929**; deficiency in ducklings and chicks, **1725**; tocopherol level of milk, **2370**; effect on turkey reproduction, **2958**; **3905**; effect on urinary excretion of amino acids, **2974**; review of literature on role in poultry nutrition and diseases, **3236**; prevention of paralysis in vitamin E-deficient mice by trace elements, **3570**; muscular dystrophy in lambs associated with tocopherol milk and plasma levels in ewes, **3903**; tocopherol levels in heart muscle, **3904**.
See also Encephalomalacia, Avian; Perosis; Teeth.
VOCAL CORDS. See Barking.

W

WARBLES. See Oestridae, Hypoderma.
WARFARIN. See Poisoning, organic.
WARTS. See Papilloma.
WATER. Requirement and metabolism in animals, **178**; water and electrolyte metabolism in goats, **1003**; requirement of zebu, **1465**; importance for cattle, **2657**; requirement of camels, **3012**; total body water estimation in pigs with antipyrin (phenazone), **3275-3276**.
See also Detergents; Growth, growth factors; Pfeifferella Whitmori Infection; Poisoning, general, inorganic; Salmonella Infection, general.
WCS-90. See Viruses, General.
WEATHER. See Magnesium; Temperature, environmental.
WEIGHT, BODY. See Growth.
WELTMANN REACTION. In healthy dogs, **2991**.
WEST INDIES. See Man, Diseases of Animals Transmissible to and from; Reports.
WHEAT PASTURE POISONING. Serum values in cows, **1344**; in C.S.I.R.O. report, Australia, **1472**.
WHEY. See Growth, growth factors.
WHITE MUSCLE DISEASE. In calves, **2971**.
WHITESIDE TEST. See Mastitis, Bovine.
WING GANGRENE. See Nutrition, in relation to disease.
WILD ANIMALS AND BIRDS. See Anaesthesia and Analgesia; Babesia Infection; Brucella Infection, general; Circulatory System, general; Diseases, General; Distemper, Dog; Duck Plague; Echinoparyphium; Encephalomyelitis, Equine; Enteritis, Feline; Hepatocystis; Histomonas Meleagridis Infection; Immunology, precipitation test; Leucocytozoon Infection; Mucosal Disease; Newcastle Disease; Periarteritis Nodosa; Psittacosis; Psittacosis - Lymphogranuloma Group; Rabies; Rickettsia Infection, Q fever; Salmonella Infection, general; Schistosoma; Setaria; "Squirrel Jaundice"; Stomatitis, Vesicular; Syngamus; Temperature, environmental; Toxoplasma Infection; Trichinella; Vermin Control; Wuchereria.
WOHLFAHRTIA. See Blowflies and Fleshflies.
WOLVES. See Distemper, Dog.
WOOL. Growth on sheep on various diets, **1461**; estimation of fleece weight, **1462**; Selenium content, **1763**; photoperiodic hormone response of wool growth, **1821**; influence of adrenal cortex, **2085**; effect of copper deficiency, **2674**; effect of pregnancy and environment, **2747**; effect of sodium fluoride, **2748**; effect of maternal nutrition, **3550**.
See Pasturella Infection, in sheep; Pseudomonas.
WORLD HEALTH ORGANIZATION (WHO). See Hygiene, food.
WOUNDS. Effect of local antibiotics on wound bacteria, **776**.
See also Skin.
WUCHERERIA. A parasite resembling W. malayi in domestic and wild animals in Malaya, **2018**.

X

XANTHINE. See Kidneys.
XANTHOMATOSIS. In fowls, **1759**.
XENOPUS. See Frogs and Toads.
XEROSIN. See Influenza, general; Skin, diseases.
X-RAYS. Radiology in veterinary diagnosis, **2979**; xeroradiography—blackboard X-ray, **3944**.
See also Bones; Foreign Body Syndrome, Cattle; Heredity, of disease; Immunology, antibodies and antigens; Radiations; Mammary Gland; Pregnancy, diagnosis; Skin, diseases.

Y

YATREN. See Theileria Infection.
YEASTS. As cause of mastitis in cows, **1565**; mastitis caused by blastomycetes, **1566**; pulmonary blastomycosis in mink, **2226**; liver protein regeneration and necrogenic activity of yeast proteins, **2959**.
See also Candida; Digestive System, fauna and flora; Foot and Mouth Disease, virus; Torulopsis.
YELLOW FAT. Differential diagnosis from icterus in meat, **1807**.
YELLOW FEVER. Coagulation defect in Rift Valley and yellow fever, **3474**.
YOLK. See Growth, general.
YUGOSLAVIA. See Babesia Infection, sheep; Epidemic Cough; Influenza, cattle; horses; Leishmania Infection; Leptospira Infection, general; Newcastle Disease, immunology; Rabies, virus; Reports.

Z

ZANZIBAR. See Reports.
ZEBU. See Babesia Infection; Genital System, oestrous cycle; Hump; Mycobacterium Tuberculosis Infection, general; Nervous System, spinal cord; Pleuropneumonia, Bovine Contagious; Skin, general; Temperature, body; Water.
ZINC. Absorption, deposition and placental transfer in rats, **203**; effect of deficiency on male genital system, **1361**.
See also Parakeratosis; Poisoning, inorganic; Round Heart Disease; Semen and Spermatozoa, general.
ZOOLOGICAL GARDENS. See Enteritis, Feline; Hepatitis, Canine Virus; Mycobacterium Johnei Infection; Newcastle Disease, general; Salivary Glands.
ZOONOSES. See Man, Diseases of Animals Transmissible to and from.
ZOOTECHNY. Rearing orphan piglets, **521**; livestock productivity of Snowdonia, **1051**; prevention of flight, **1052**; buffalo husbandry, **1053**; face cover and productivity of sheep, **2460**; Book, care of the hooves of cattle, **2472**; hogget rearing and ill thrift, **2695**; book, breeding cattle for unfavourable environments, **2765**; effect of debeaking on performance of fowls, **3323**; Brahman cattle grow faster than British in North Queensland, **3324**; husbandry of laboratory mice, **3590**; reproduction in a herd of Large White pigs, **3642**; effect of blood serum given parenterally, on vitality and productivity in farm animals, **3644**.
See also Conferences and Congresses; Growth, general; Hygiene, livestock; Pastures and Grazing.

ERRATA

p. 6, abst. 36. In title, for "Peshawer," read: Peshawar.

p. 13, abst. 80. In title translation: For "sarcysts," read: sarcocysts.

p. 31, abst. 208. Lines 2 and 3 of title should be transposed.

p. 37, abst. 253. The last author's name is JARNUM, S. A., not JARUM, S. A., as printed.

p. 44. abst. 295, line 3. For "1,000 *(sic)* i.u.," read: 10,000 *(sic)* i.u.

p. 50. The last line: "Scott in *Bull. epiz. Dis. Afr.* **3**, 117-119. (2)" should follow line 4 on page 51.

p. 56. abst. 349. Title line 1. For "SEELEMAN," read SEELEMANN.

p. 62, abst. 392, line 2. For "50 ml." read: 5·0 ml.

p. 71, abst. 450. Line 3 of title: The volume number should be **111** and not **3** as printed.

p. 60, abst. 380. Title line 9. After the words "adrenaline on the," please insert "agglutination reaction; the."

p. 80, abst. 499. Title, line 2. For "*spilalis*" read: *spiralis*.

p. 125, abst. 765, line 7 of abst. For "an anti-toxin" read: a toxoid.

p. 150, abst. 922. Line 7 of abst. For "50 mg." read: 50 g.

p. 183, abst. 1114. For "SCHIMIZU, K.," read SHIMIZU, K.

p. 259, abst. 1564. Line 7 of abst. For "95 of 150 feet treated . . ." read: 95 of 105 feet treated . . .

p. 261, abst. 1575. Lines 6 and 7 should be deleted. The journal reference should read: *Sborn. ces. Akad. zemědělsk. Věd. Živoč. Výr.* **28**, 617-628. [In Slovak. German and Russian summaries.]

p. 346, abst. 2078. In English translation of title, for "1950" read 1954.

p. 374. abst. 2244. Lines 3—4. For "a reduction of one eighth to to one sixteenth," read: a reduction to between one eighth and one sixteenth.
abst. 2246. Line 3 of abst. For "0·03 mg./kg.," read: 0·3 mg./kg.

p. 376, abst. 2254. Line 4 of abst. For "cilates," read: ciliates.

p. 390, abst. 2349. In place of line 1 of abst., please read: "I. piperazine,". [The chemical name given in line 1 is incorrect—(see title).]

p. 395, abst. 2386. Line 2 of title. For "Pathogeneisis," read: Pathogenesis.

p. 406. The last line in column 2 is misplaced. It belongs to abst. 2453 and should be the first line in column 2.

p. 408, abst. 2467. Line 2 of title. For "Liepzig," read: Leipzig.

p. 455, abst. 2758. For "SARKISOVA, A. K.," read: SARKISOV, A. K.

p. 458, abst. 2772. Title line 1. For "SEELEMAN," read: SEELEMANN.

p. 462, abst. 2800. The first author's name is BODA, K., not "BOD'A, K." as printed.

p. 488. Title line 1. For "ANTIPIN, D. H.," read: ANTIPIN, D. N.

p. 522, abst. 3153. Title line 3. For "encephalomelitis" read: encephalomyelitis.

p. 578, abst. 3511. Title line 1. For "NIKOFOROVA," read: NIKIFOROVA.

p. 621, abst. 3782. Title line 1. For "YAZVIKOVA," read: YAZUIKOVA.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.